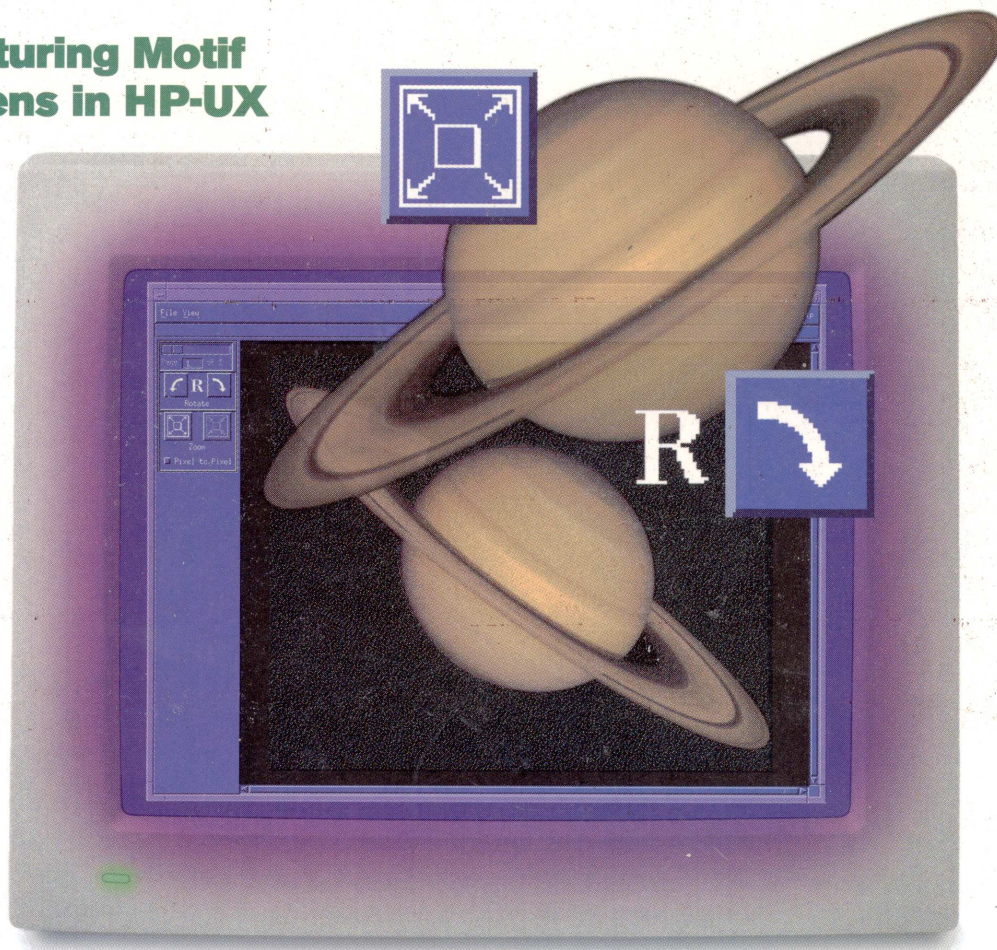


# hp·ux / usr

Hands-On Solutions for HP-UX Users • September 1993

## Capturing Motif Screens in HP-UX



**HP's Advanced Image Management System • Strategic Rightsizing  
Sharing COM Between BASIC/UX and C**

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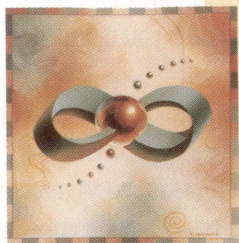
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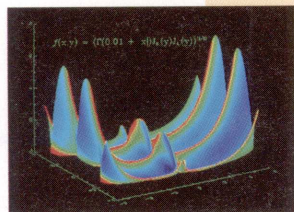
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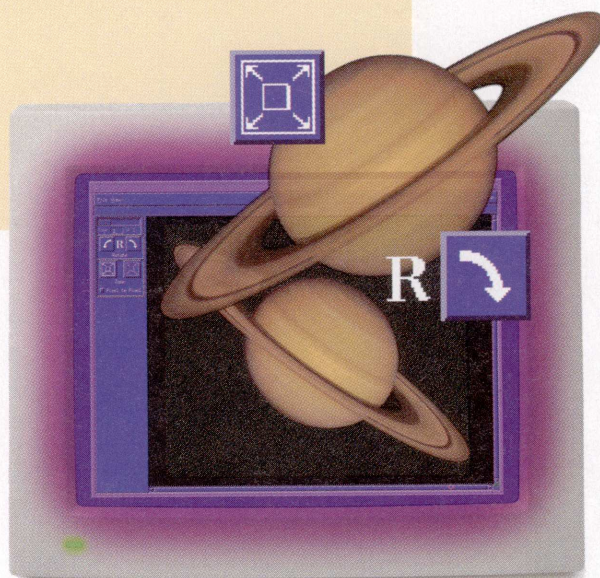
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The image of Saturn in the illustration is available over the Internet from Jet Propulsion Lab.



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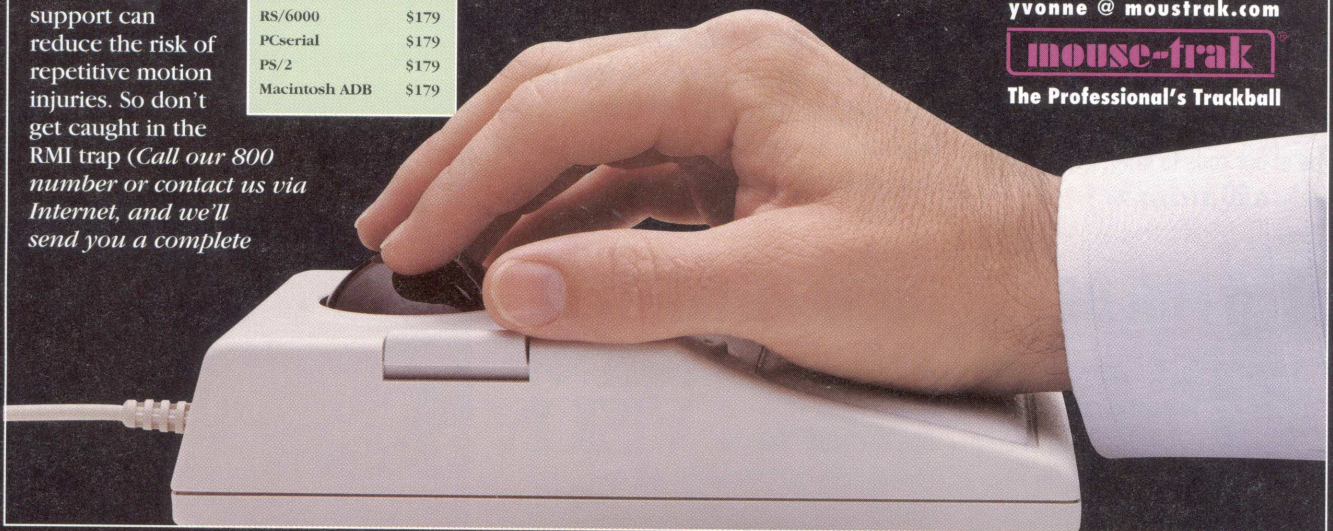
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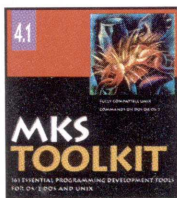
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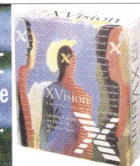
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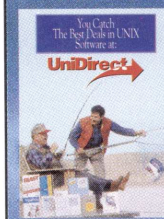
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## Question & Answer

**Q:** I'm having problems adding a long list of hosts to my JetDirect printer.

**A:** When a long list of hosts is given to a JetDirect printer, if the list exceeds 10 names or IP addresses, the boot download will fail with the message (in `/usr/adm/syslog`):

```
printer: config file error line: 13 CF ERR - TRAP LIST EXCEEDED
```

The actual format of the message is:

```
<date/time> <printer's NetName> printer: <error  
<printer's NetName>  
printer: <error definition>  
line: <line in the file /users/tftp/hpnp/<printer_name>.cfg>  
<ERROR_DESCRIPTION_IN CAPS>  
"text_of_the_line_with_a_problem"
```

In this case, the line would point to an "allow.." statement. That line plus any additional lines must be removed to allow the bootp download to succeed.

**Q:** Where can I log printer error messages for my JetDirect printer?

**A:** Error messages and status events can be logged to the `/usr/admsyslog` file by specifying the syslog server in `/usr/lib/hpnp/hnpncfg` when configuring the bootp server information. However, this can be added manually to the two files needed to change the logging facility. First, an entry in `/etc/bootptab` that specifies an IP address for the CPU to do the logging. Here's an example:

```
:lg=15.17.184.24:\
```

where `:lg=` is the tab that indicates a syslog server entry. If the default logging facility (`lpr`) is desired, this is the only change needed. To activate the facility, simply cycle power on the printer and the new configuration will be read. If there are multiple bootp servers defined, all the servers will need their bootptab files changed.

In order to allow a different logging facility to be invoked, for example `local0` through `local7`, you must add an entry into the printer's tftp configuration file located in `/usr/tftpdir/hpnp` as in:

```
syslog-facility: local2 15.17.184.29
```

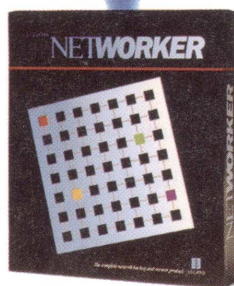
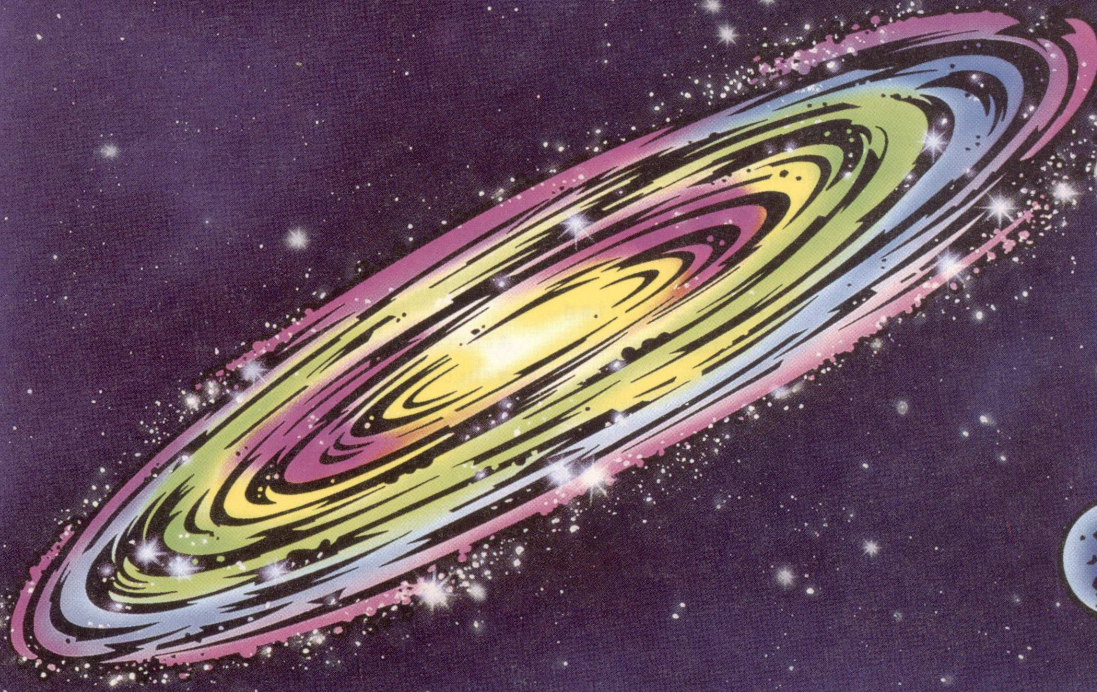
This assumes that the printer has an entry in bootptab for tag `T144` that specifies `hpnp/<printer_name>.cfg`, which refers to this file. If this file did not exist, it would be simpler to use `hnpncfg` to remove the bootp server for this printer and then re-add it, specifying the syslog server, contact name, location, and so on.

**Q:** I am seeing the error: "Internal error: invalid value ### passed to /etc/envd". What is wrong?





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**A:** The above error message is typically caused by an invalid named pipe called `/tmp/envd_diag`. If this is not a named pipe, for instance, an ordinary ASCII file, then the `/etc/envd` program tries to use the data provided by the program and determines that the format is not correct, thus producing the error message.

To correct the problem, remove the `/tmp/envd_diag` file, kill and restart `/etc/envd`, and the problem will go away.

**Q:** I have some "core" files in various directories. Is there a way to determine the name of the original program?

**A:** The program name is not stored with the executable file since it can easily be renamed, so you have to search some of the tables inside the core file to locate the name. Here is one way to locate the name:

1. Create a script, call it `whocore` or whatever:

```
#!/bin/sh
echo \${m} | adb $1 | fgrep "/ map (in"
```

2. Do a `chmod +x whocore`

3. Now run the program on core files:

```
whocore /users/blh/core
```

The listing will say "'core' from 'program'" in the output.

*Bill Hassell is an HP-UX system support engineer at the HP Atlanta Response Center. He can be contacted at his e-mail address which is [blh@hpuaatl.com](mailto:blh@hpuaatl.com).*

## HP 9000 Workstations

**Q:** I recently purchased a RasterOps Videolive Card (HP Part Number Z110A). After installing in an EISA slot in a 715, I am unable to run `tv_align` or the grabber program. When I the run `tv_align` program, I get the error message

"Your display has no Xv video adapters.  
There is no XV support available"

**A:** The following are the steps you need to follow in order for the Videolive software to work correctly:

1. First remove the videolive file sets that are already existing on the system.
2. Halt the system and turn power off.
3. Reboot the system.

4. Install the Videolive software.

5. Halt the system and turn power off.

6. Install the Videolive card and make sure it is seated correctly in the slot.

7. Reboot the system.

If it still returns an error message, do the following:

- check cable
- check for wrong X-server (check `/usr/bin/X11/X`)
- check in file `/usr/lib/X11/vue/Vuelogin`
- include iomap driver in the kernel
- look for defective hardware

**Q:** I am unable to run the audio server on my 720. What am I doing incorrectly?

**A:** Audio hardware is built into Series 705, 710, and 715 computers and is included in the upgrades from:

720 to 725

730 to 735

750 to 755

Note that 705s may not have audio software. In addition, 720s, 730s, and 750s without the upgrade do not have audio hardware even though they have a jack labeled "audio."

**Q:** I am running HP LaserROM on my HP 700/96 terminal. I have set the shell variable `LROMTERM` to `hp`. When I run the `lrom` command, the screen is not being updated properly. For example, when `lrom` first starts, it shows a dialogue box with a message saying that the dialogue box will go away in three seconds, but that box does not go away and subsequent messages simply overwrite that dialogue box. Why is the terminal screen not being updated properly?

**A:** In this case the problem is caused by an incorrect setting in the terminal configuration of your HP 700/96 terminal. When using HP LaserROM with an HP terminal, you should set the field

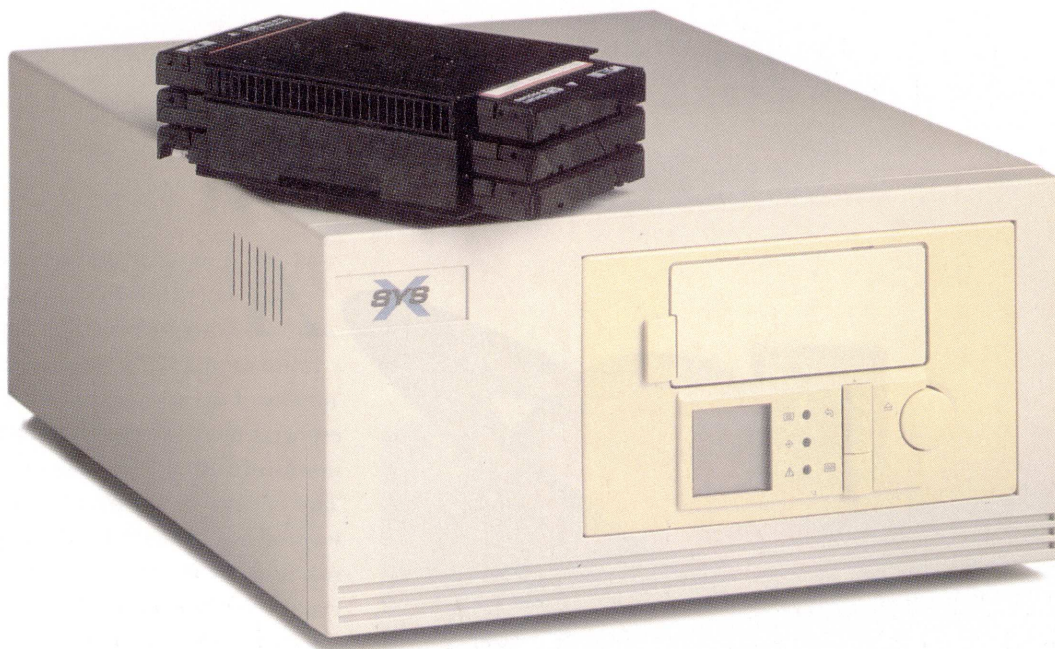
```
InhEoLWrp(C)
```

to "NO" in the terminal config screen and then save that configuration. ■

*Kaushik Mehta of the Hewlett-Packard Response Center in Atlanta, Georgia, answers workstation questions.*



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**CIRCLE 57 ON READER SERVICE CARD**



by Bill Hassell

# Capturing Motif Screens in HP-UX

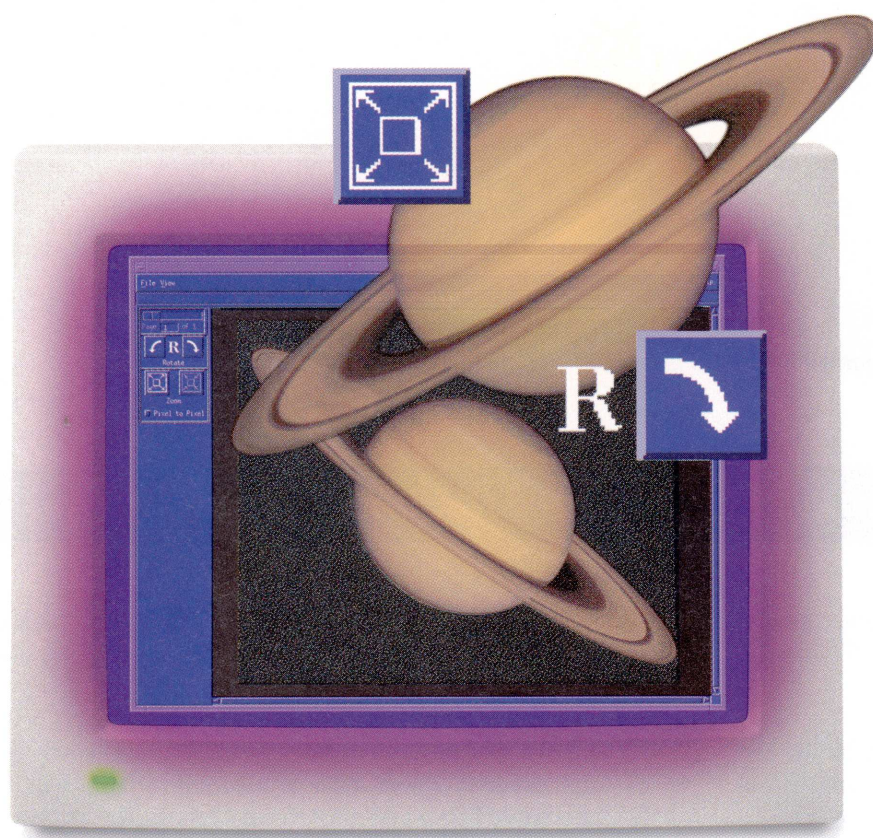


Illustration by Nea Bicek

As more and more articles concerning the Graphical User Interface (or GUI for short) continue to appear, it is apparent from the quality of the screen shots that a wide variety of methods are used to capture the information from X Windows environments. The results range from the bluish-gray, washed-out colors from a photograph of a monitor, to the crisp, brilliant colors of a converted bitmap. Getting what you see into print is challenging, although the task seems simple enough. One of the challenges in going from a simple bitmap copy of a screen to a published article is the myriad of bitmap formats—such things as TIFF, GIF, PCX, BMP, and in the case of X Windows, the xwd bitmap format, which is not part of the PC world of formats.

A bitmap is essentially a copy of the 1's and 0's contained in each pixel (picture element or dot on the screen) where a black-and-white image would be represented exactly as it appears on the screen. The next step is a gray scale display in which there are shades of gray. In this case, the image consists of 2 or more bits for each picture element.

Two bits would allow four distinct levels: black, dark gray, light gray, and white. More bits per picture element means more shades on the screen.

With colors, each pixel is composed of red, green, and blue, the primary additive colors, along with an intensity for each color. In much the same way as gray scales indicate intensity, shades of colors are represented as three numbers. These numbers can be 2 bits, or for high-color systems, 8 bits per color where 256 shades of a single color are possible. Taken as a whole, an 8-bit color system is also known as 24-bit color or a 16 million color system.



This color capability doesn't come cheap: For every picture element on the screen, 3 bytes of data are needed to represent the color at that location. A low-resolution (by workstation standards) display such as Super VGA (600x800) will have 480,000 pixels on the screen and to display 24-bit color, 1.44 megabytes of memory are needed. Today's workstations are typically high-resolution at 1280x1024 for a total of 1.3 million pixels.

The conversion of up to 3 megabytes of information into a different format such as LaserJet 300 dots per inch resolution or desktop publishing format is the subject of this article.

In the premier issue of *hp-ux/usr*, my article on LaserROM/UX prompted a number of inquiries as to the technique I used to produce the screens, so I figured that there must be a story there. First, some off-the-shelf basics:

xwd: Used to capture screens in the X Windows environment  
 xwud: Used to display xwd images  
 xpr: Prints the output from xwd  
 xwd2sb: Converts xwd to StarBase format (see pcltrans)  
 pcltrans: Prints StarBase bitmap images  
 screenpr: Prints StarBase bitmap images (similar to pcltrans except it can read image direct from /dev/crt0)  
 imageview: Starting with 8.07, it displays TIF files (many more with 9.0+)

Except for pcltrans, all the above programs are in the /usr/bin/X11 directory. Let's start by copying the screens to printers such as the LaserJet or PaintJet using xwd and xpr or pcltrans.

#### *xwd/xwud/xpr*

xwd and xpr are used together. In the simplest form, the command:

```
xwd -frame | xpr -landscape -device ljet|lp -oraw
-dmy_printer
```

will capture the screen (including the surrounding frame), call xpr to perform the conversion to landscape and LaserJet format, and send the results to lp. Note the -oraw option! This is always required for binary images such as bitmaps.

Now the first thing you'll find is that xwd and xpr are probably not in your \$PATH variable; they are located in /usr/bin/X11. The next thing that you'll notice is that nothing seems to happen after typing this command except that the cursor changes to a + shape. That's xwd's pointer and it must be positioned over the window to be captured. Then, by clicking the mouse button, the capture begins.

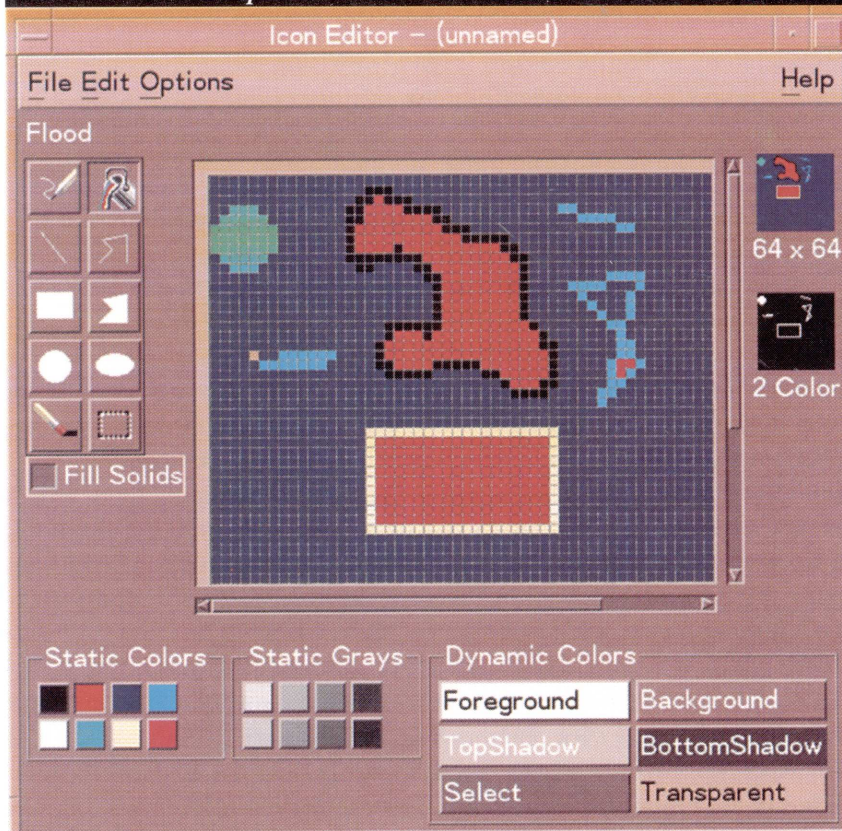
Can you capture the entire screen with all the windows? Yes, but you must click on the background or the 'root' window, or you may use the option to xwd: -root, which eliminates the mouse click. You may have noticed that it doesn't take too long for the + to show up and once it is visible, the mouse pointer doesn't work the same way. Specifically, once the pointer has changed, it is under the control of xwd and using the mouse to auto-raise or to activate a specific window will not work.

That's why clicking on a lower window will show items that are on top of the desired window. So I came up with a script to perform the needed capture:

```
#!/bin/sh
#
# This is a sample script to copy an X window to a printer.
#
# The programs:
#
# /usr/bin/X11/xwd and
# /usr/bin/X11/xpr
#
# must be on the system executing this script and
# the ops system must be 8.0 or higher.
#
# PARAMS: display_to_capture printer_name
#
if [ "$#" -lt 2 ]
then
echo
echo "Usage:"
echo "$0 name_of_display name_of_printer"
echo
exit 1
fi
```



FIGURE 1A: Paper version



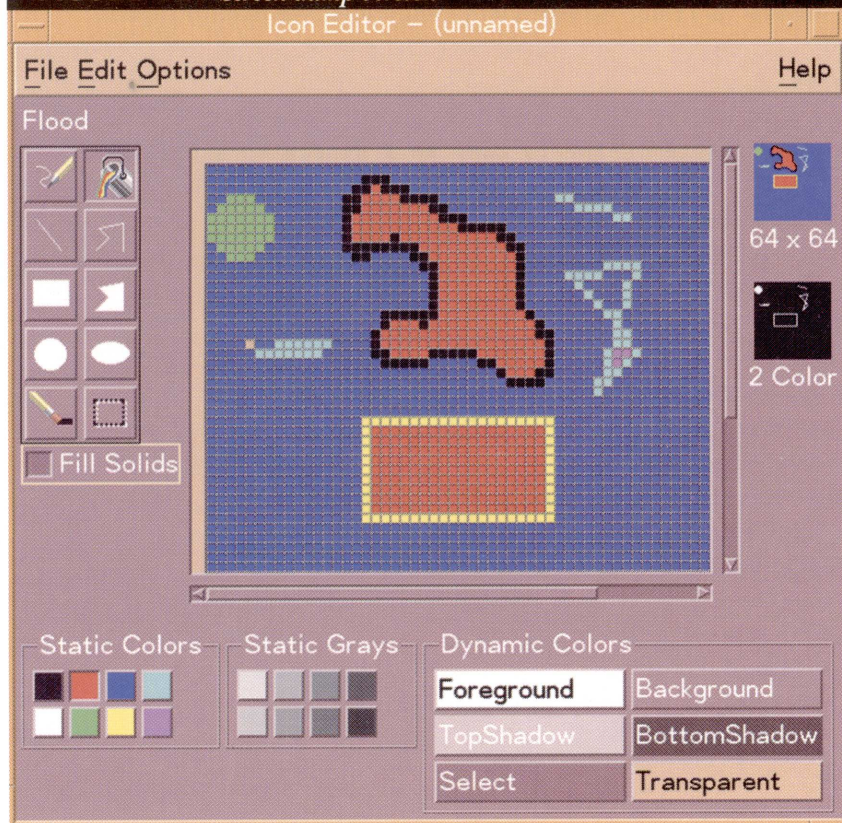
```

XPATH=/usr/bin/X11
DISPLAY=$1:0
export DISPLAY
echo
echo "Activate/raise the window to be
      captured; then"
echo " click once inside window when
      ready..."

echo
sleep 2
$XPATH/xwd -frame| $XPATH/xpr
    -landscape -device ljet\
    | lp -oraw -onb -d$2
echo ...Copy done, now printing on
$2...

```

FIGURE 1B: Screen dump version



In the script, two parameters are required: the name of the display, which is usually your own workstation or X/terminal name, and the name of the printer. In this script, xpr's options require a LaserJet.

Notice that I said usually your own workstation. With the X Window System, it is possible to capture images from other workstations. Simply specify the name of the other workstation and the cursor will pop up on the other screen.

I've added "sleep 2" to the script, after the echoes prompt you to select a window. This gives you enough time to move the regular mouse pointer to the desired window, activate it, and then click the mouse when ready. As you use xwd a lot, this sleep command will be invaluable.

In this script, I've also put the option `-landscape` into xpr since most of the windows I copy are horizontal or landscape mode. This script could be enhanced to add an option at the end that specifies the orientation, and real shell programmers might make the orientation optional and select `-landscape` if only two parameters are supplied.

How about capturing the image to a file? Just xwd is all that's needed as in the command:



```
xwd -frame > my_file.xwd
```

In the file `my_file.xwd`, the captured image is ready for further processing, including a check to see if it is correct. To do this, simply use the file as input to `xpr` or to `xwud`. Here's an example of both:

```
xpr -device ljet my_file.xwd
xwud my_file.xwd
```

The first example prints the file and the second will redisplay the image in a window on your display. To delete the display, just click on the `xwud` image or type `q` or `Q` or even `CTRL-C` in the window.

Later in this article, I will discuss using the `xwd` file as input to format converters which are needed to provide compatible files for desktop publishing.

What are some of the options available to `xwd`, `xwud`, and `xpr`? Here is a list of the more interesting options for the three programs:

#### *xwd options:*

##### *-display*

This argument allows you to specify the server to use in capturing the display. A 'server' is defined in X Windows as the device showing the windows. The form is: ``hostname`:0.0`. As an example

```
xwd -display kobra4:0.0
```

will capture a window from the computer `kobra4`.

##### *-nobdrs*

This option specifies that the window dump should not include the pixels that compose the X window border. This is useful in situations where you may wish to include the window contents in a document as an illustration.

##### *-add <value>*

This option specifies a signed `<value>` to be added to every pixel. For example, in a color picture, this would lighten or darken the image.

##### *-xy*

This option applies to color displays only. It selects XY format dumping instead of the default Z format.

##### *-frame*

This option indicates that the window manager frame should be included when manually selecting a window.

##### *-root*

This option indicates that the root window should be selected for the window dump, without requiring the user to select a window with the pointer.

##### *-id <id>*

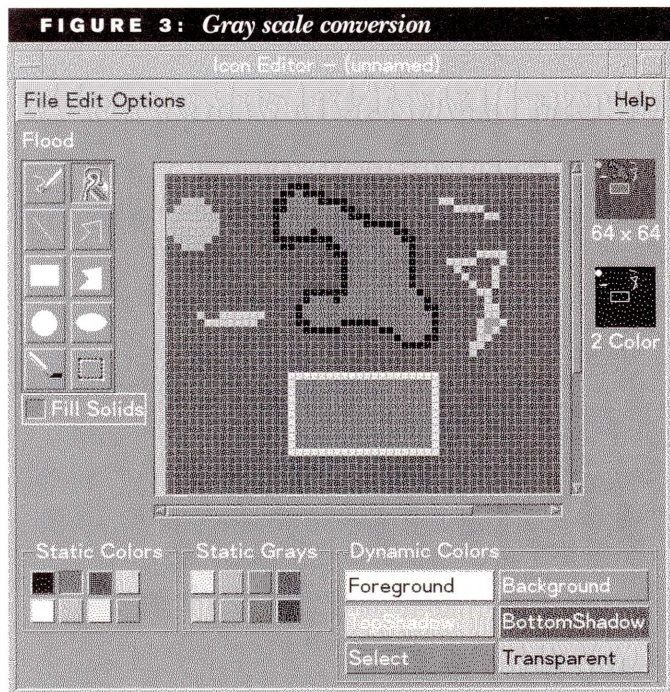
This option indicates that the window with the specified resource id should be selected for the window dump, without requiring the user to select a window with the pointer.

##### *-name <name>*

This option indicates that the window with the specified







WM\_NAME property should be selected for the window dump, without requiring the user to select a window with the pointer.

#### *xwd options:*

`xwd` is the opposite of `xwd`; it displays a captured image. `xwd` is a good tool to use to check the image before sending the data off to be converted.

#### *-display*

This argument allows you to specify the server to use in displaying image. A 'server' is defined in X Windows as the device showing the windows. The form is: ``hostname':0.0`, e.g.,

```
xwd -display kobra4:0.0 my_file
```

will display a window onto the computer `kobra4`.

#### *-geometry geom*

This option allows you to specify the size and position of the window. Typically you will only want to specify the position, and let the size default to the actual size of the image.

#### *-plane number*

You can select a single bit plane of the image to display with

this option. Planes are numbered with zero being the least significant bit. This option can be used to figure out which plane to pass to `xpr(1)` for printing.

#### *-raw*

This option forces the image to be displayed with whatever color values happen to exist currently on the screen. This option is mostly useful when undumping an image back onto the same screen it originally came from while the original windows are still on the screen, and results in getting the image on the screen faster.

#### *-rv*

If a bitmap image (or a single plane of an image) is displayed, this option forces the foreground and background colors to be swapped. This may be needed when displaying a bitmap image which has the color sense of pixel values "0" and "1" reversed from what they are on your display.

#### *xpr options:*

##### *-device <devtype>*

Specifies the device on which the file will be printed. Currently supported:

la100	Digital LA100
ljet	HP LaserJet series and other monochrome PCL devices
	PCL device such as ThinkJet, QuietJet, RuggedWriter, HP256x, and HP293x printers
ln03	Digital LN03
pjet	HP PaintJet (color mode)
pjetxl	HP PaintJet XL printer (colormode)
pp	IBM PP3812
ps	PostScript printer

The default is LaserJet. `-device lw` (LaserWriter) is equivalent to `-device ps` and is provided only for backwards compatibility.

##### *-height inches*

Specifies the maximum height of the page.

##### *-width inches*

Specifies the maximum width of the page.



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#### All others:

IEM International Sales  
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Fort Collins, CO 80524  
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**-left inches**

Specifies the left margin in inches. Fractions are allowed. By default the window is centered in the page.

**-top inches**

Specifies the top margin for the picture in inches. Fractions are allowed.

**-header string**

Specifies a header string to be printed above the window.

**-trailer string**

Specifies a trailer string to be printed below the window.

**-landscape**

Forces the window to print in landscape mode. By default a window is printed so that its longest side follows the long side of the paper.

**-portrait**

Forces the window to be printed in portrait mode. By default a window is printed so that its longest side follows the long side of the paper.

**-rv**

Forces the window to be printed in reverse video.

**-plane number**

Specifies which bit plane to use in an image. The default is to use the entire image and map values into black and white based on color intensities.

**-gray 2 | 3 | 4**

Uses a simple 2x2, 3x3, or 4x4 gray-scale conversion on a color image, rather than

mapping to strictly black and white. This doubles, triples, or quadruples the effective width and height of the image.

**-gamma correction**

This changes the intensity of the colors printed by PaintJet XL printer. The correction is a floating point value in the range 0.00 to 3.00. Consult the operator's manual to determine the correct value for the specific printer.

**-slide**

This option allows overhead transparencies to be printed using the PaintJet and PaintJet XL printers.

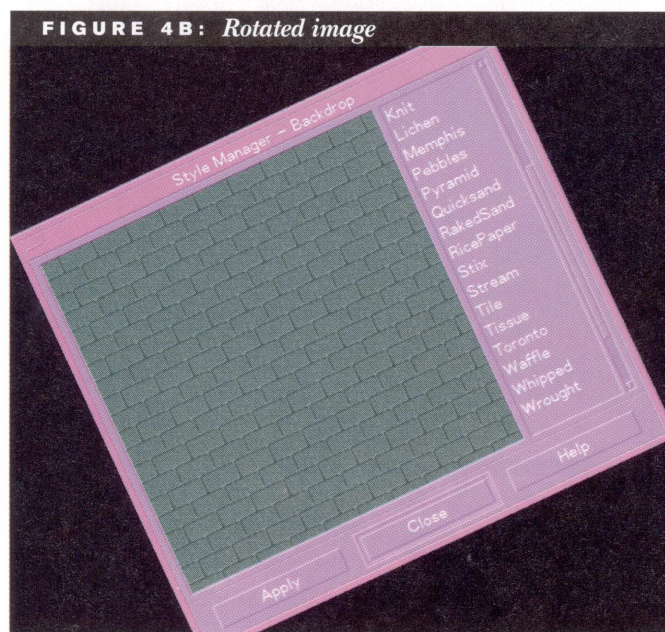
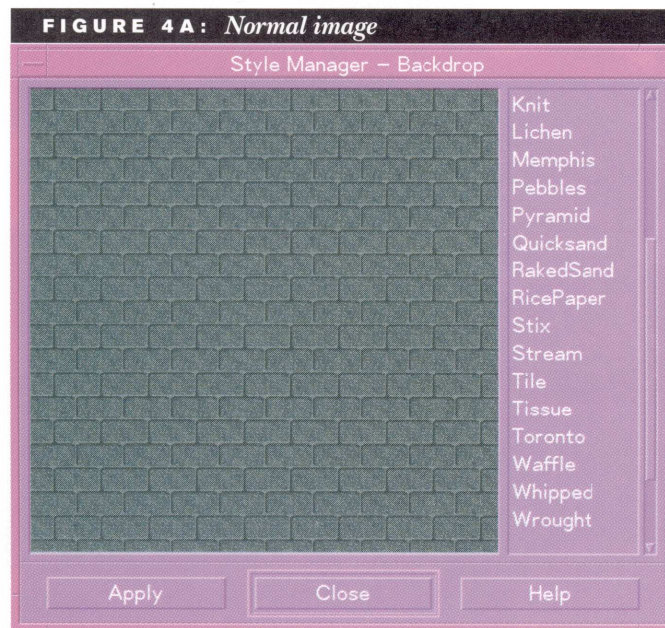
**xwd2sb/pcltrans**

These two programs are a part of the Starbase Graphics library, xwd2sb being used to convert from the captured window format into the Starbase bitmap format. As a filter or converter program, it doesn't have any options and formats STDIN from xwd format to STDOUT in Starbase format.

pcitrans is similar to xpr with a few unique options, and under some conditions, offers more flexibility for image control. Here's a simple example of using xwd, xwd2sb and pcitrans together:

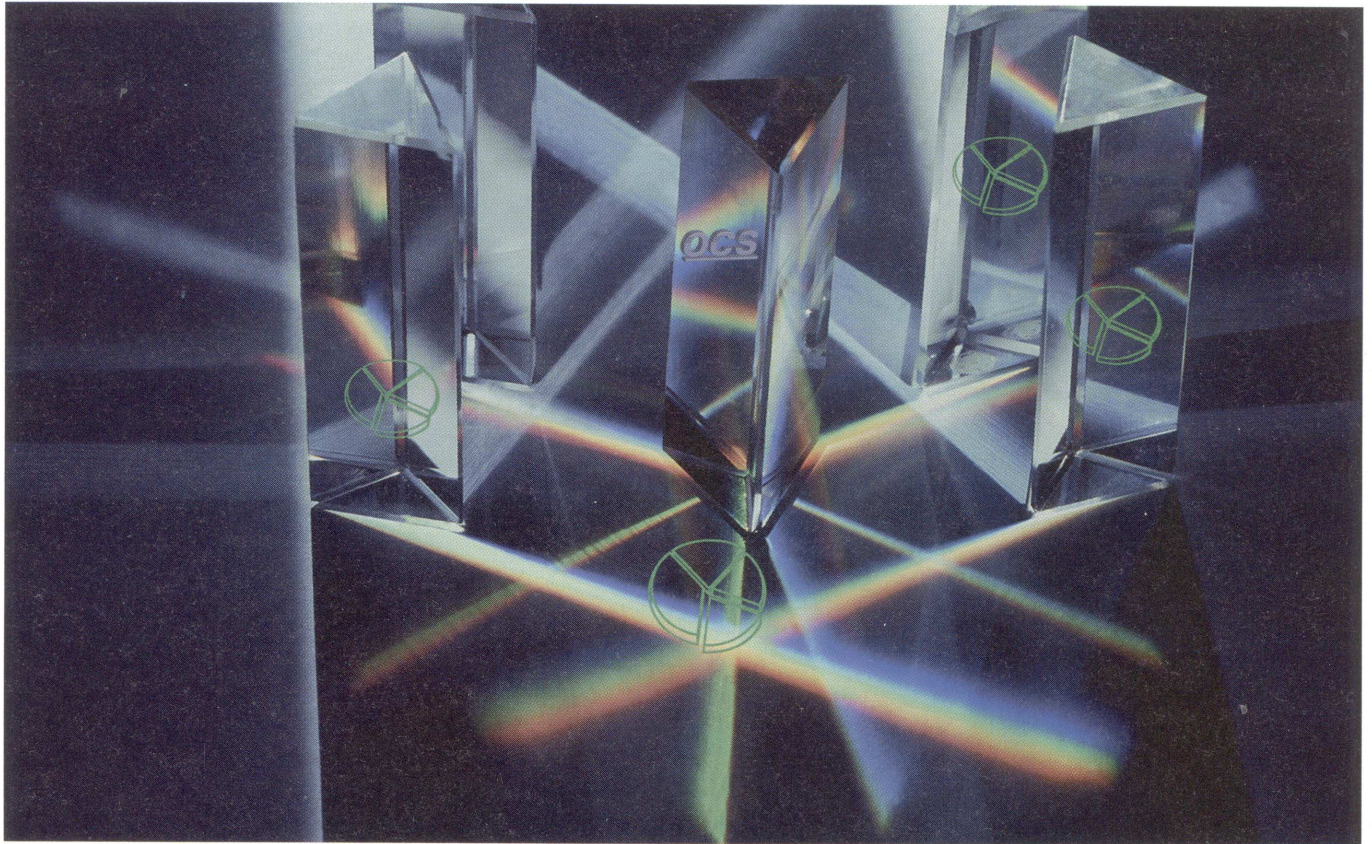
```
xwd -frame | xwd2sb |
pcitrans | lp -oraw
```

As above, the \$DISPLAY variable must have been previously set and \$PATH must include /usr/bin/X11 in order to locate xwd and xwd2sb. The first difference





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FIGURE 5A: Normal image (187 colors)



FIGURE 5B: Colors reduced to 16



you will notice is that `pcitrans` does not scale the bitmap image to fit the page as in `xpr`. Using internal tables to convert color to gray scales, `pcitrans` will use dithering to approximate the image.

Some options that might help in improving `pcitrans`:

```
<incoming_data> | pcitrans -e3 -g2.0 -a5
| <to_printer>
```

where `-e3` indicates expanding the image three times larger, `-g2.0` brightens the image to the maximum, and `-a5` specifies using the monochrome ordered diffusion algorithm to approximate the various shades. `pcitrans` is usually the best utility to use for printers that have the "imaging" capability present in many HP plotters such as the HP PaintJet series.

Here are some useful options for `pcitrans`:

#### **-C**

Each pixel is converted to the appropriate output color value using an error diffusion algorithm. This option also changes the effect of the `-c` option. Not all PCL printers support color mode. The `-a` option overrides the default algorithm.

#### **-I**

Imaging option: The output image is scaled for the best fit on the size of media loaded in the device. If the output

device has color capabilities, the image is in color by default. The data is left in RGB format and the output device prints the output in color.

The output device renders the image at its highest possible resolution, and the output image is scaled for the best fit on the size of media loaded into the output device. LaserJets do not have this feature but HP PaintJets will respond correctly.

#### **-an**

Render algorithm desired. Valid only in conjunction with the `-C` or `-I` option. The possible values of `n` are:

0 = no algorithm applied

1 = snap to printer PRIMARIES (same as specifying `-c` and `-C` together)

2 = snap black to white and all other colors to black

(can use for text screen dumps)

3 = color ordered dither (default)

4 = color error diffusion (same as the `-C` option)

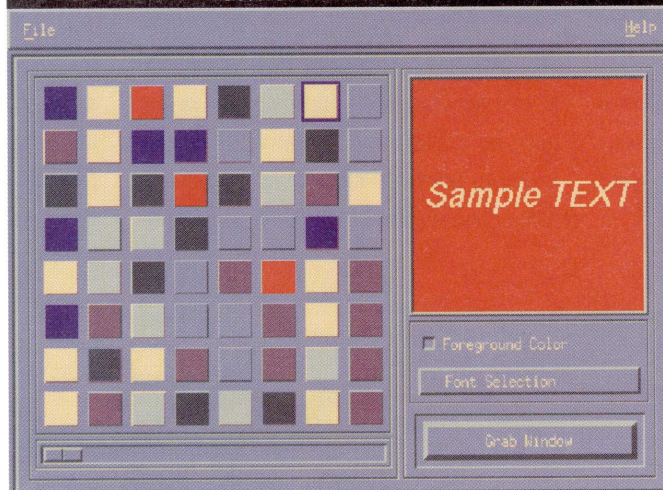
5 = monochrome ordered dither

6 = monochrome error diffusion

#### **-c**

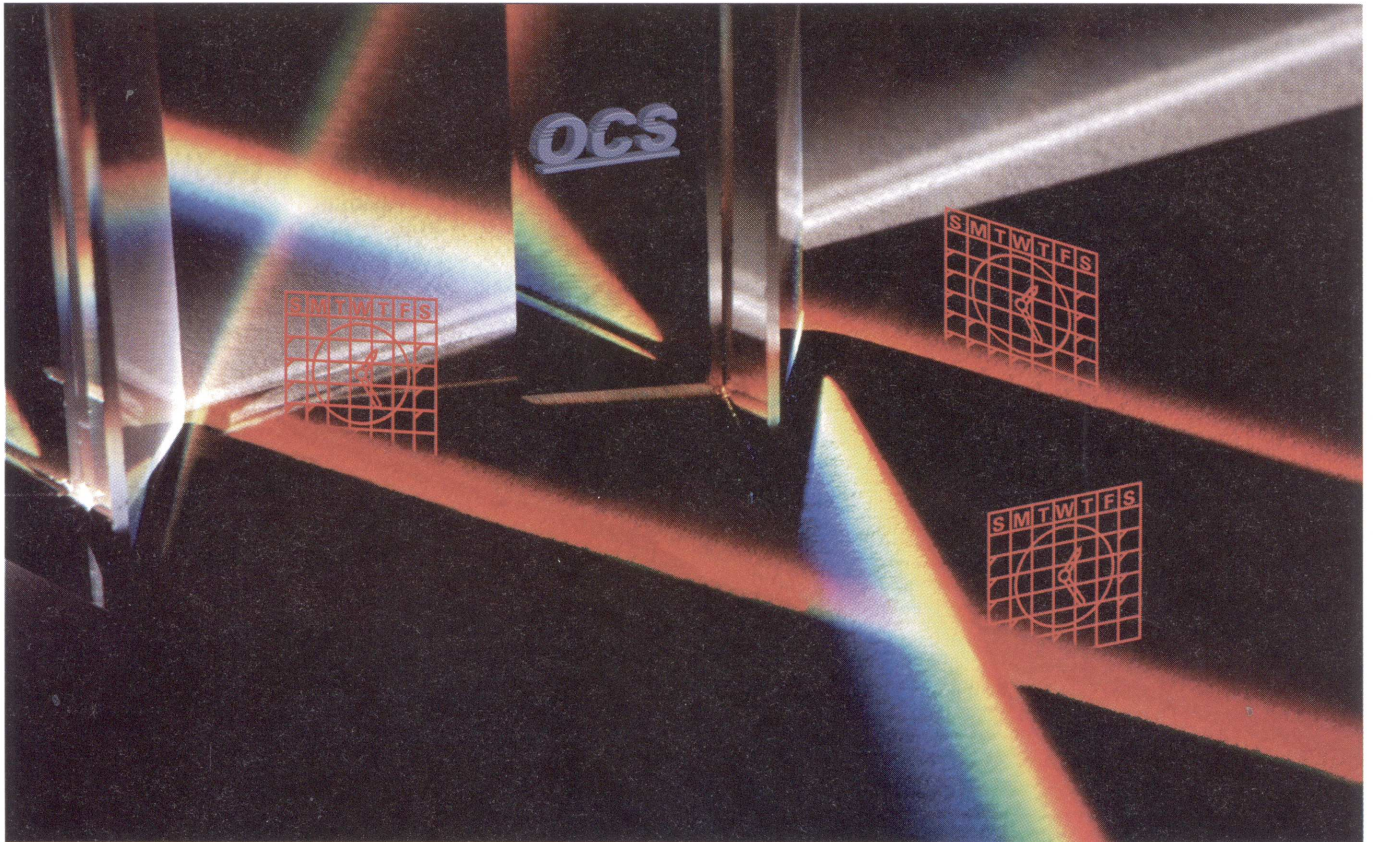
Each pixel with a non-zero RGB value is converted to black. Default is conversion to the nearest available shade of

FIGURE 5C: Colors reduced to 8





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## Browsing the Internet

The Internet is the largest collection of computing systems to be part of a global network. Originally, the Internet was called ARPANET, which under government funding started as a method to exchange information and research among both universities and companies and government agencies. A good deal of the success of the Internet came from academia, where free and enthusiastic labor brought the Internet to life.

Today, almost 50 percent of the network connections are from businesses; the rest are from universities and government connections. Offering repositories of software programs, data files and information, it ranks as the largest bulletin board system as well as the largest electronic mail delivery system in the world.

This complexity is not without difficulties, the most common being the basic design: an internetwork, or a collection of subnetworks. In its simplest form, a company may have a local LAN with a few dozen computers. By connecting their LAN to the Internet, all users now have access to the network, but it can be quite costly, both for the interconnect equipment as well as for managing the traffic and security risks.

Many companies disable incoming FTP and telnet services and many universities, with their limited budgets, must limit the size of electronic mail packages. There isn't a single, Internet-wide mailing directory, so routing e-mail can be a challenge. e-mail is a challenge to manage even in a small network so trying to get the "correct" address can be a daunting task.

The utilities mentioned in the article called Portable BitMap Utilities are available from many sites. You'll need access to the Internet. Note also that the collection of utilities is vast: you may wish to pull the man pages first to browse the available program features.

Here's a list of companies that offer Internet connections (if you're not already connected). Note that many colleges and universities also offer modem access to the net, although there can be some restrictions on the amount of data transferred.

Intercon Systems Corporation  
950 Herndon Parkway, Suite 240  
Herndon, VA 22020  
(703) 709-9890

Portal Communications  
20863 Stevens Creek Blvd.  
Cupertino, CA 95014  
(408) 973-9111

UUNET Communications Services  
3110 Fairview Park Drive  
Falls Church, VA 22042  
(703) 204-8000

Performance Systems International  
11800 Sunrise Valley Dr., Suite 1100  
Reston, VA 22091  
(703) 620-6651

Sprint International  
13221 Woodland Park Road  
Herndon, VA 22071  
(703) 904-2156

And don't forget to get a copy of the book *The Whole Internet User's Guide & Catalog*, which has invaluable tips on using the resources of the Internet.

gray. This option has a different effect if the -C option is also specified. In that case (-cC), each pixel is converted to the nearest PRIMARY color (red, green, blue, cyan, magenta, yellow, white, or black). (The effects of specifying -c and -C together is the same as for the -a1 option. Note: the -a option overrides this combination.)

### -R

Output print orientation is left to right across the width of the paper (analogous to portrait mode on the LaserJet printer). Default is left to right across the length of the paper

(landscape mode). Raster rotation is performed by pcltrans rather than changing printer modes.

### -x<sup>inches</sup>

Destination image offset, x inches from the left boundary. Valid only in conjunction with the -C or -I option.

### -y<sup>inches</sup>

Destination image offset y inches from the top boundary. Valid only in conjunction with the -C or -I option.



**-d inches**

Width of the destination image in inches. Valid only in conjunction with the -C or -I option.

**-h inches**

Height of the destination image in inches. Valid only in conjunction with the -C or -I option.

**-l length**

Length of the paper in inches. Not valid when -C or -I are also specified. The default is 10.5 inches.

**-P**

The output image is scaled for the best fit on the size of media loaded in the device. Valid only in conjunction with the -C option.

**-w width**

Width of paper in inches. Not valid when -C or -I are also specified. The default is 8.0 inches.

**-g value**

Gamma correction value to apply to the image. Accepted values may range between 0.0 and 2.0. This is valid only in conjunction with the -C or -I option.

**-T**

Print on transparency film. Valid only in conjunction with the -I option. This tells HP PaintJets to use extra ink for the transparency.

Typically, `peltrans` is used only for HP printers while the more universal program `xpr` is used for non-HP printers or for Postscript output. Currently, `xpr` does not support color Postscript and will map color images to black and white. A shareware program called `xwd2ps` can help in this case. It is

available from MIT's ftp repository `atexport.lcs.mit.edu`. See "Browsing the Internet" later on for more information.

**Getting ready for publication**

The `xpr` and `peltrans` commands work well with the LaserJet, DeskJet, and PaintJet printers, but 300 dots per inch, although fine for presentations with slides and paper, is a very low resolution for publications, especially glossy magazines such as *hp-ux/usr*. This magazine is prepared at a resolution of 2,540 dots per inch! Thus, using paper images at 300 dots per inch will not be as crisp as those made directly from the screen captures. See Figure 1a for an example of a paper original made with the PaintJet XL-300 and compare it to Figure 1b,

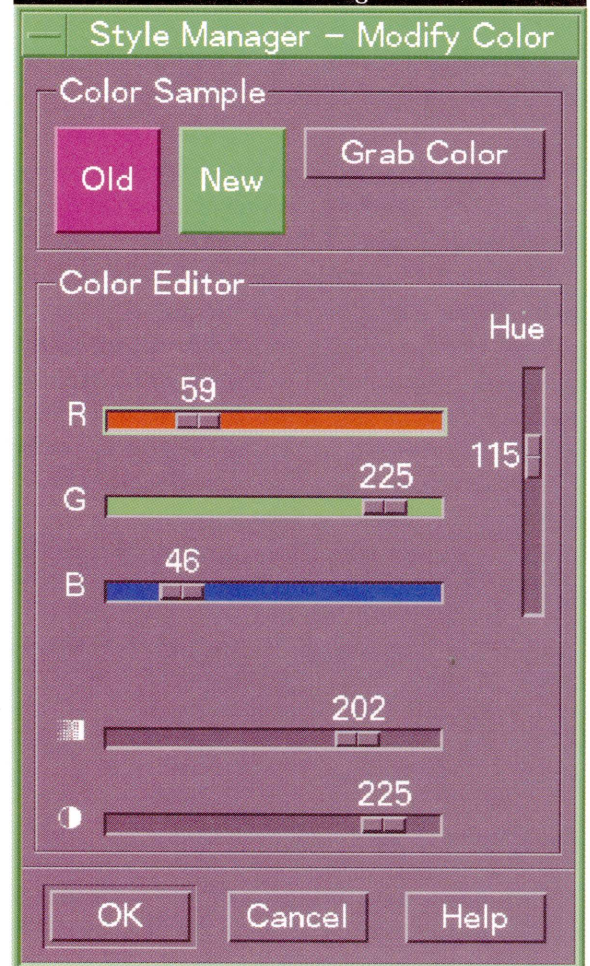
which is an `xwd` capture of the same image. For the captured image, the following command was used to create a `.PCX` file:

```
xwd -frame | xwdtopnm | pnmtoPCX > figure1b.pcx
```

Aha! Where did I find `xwdtopnm`, etc.? These are utilities from the PBM package, a group of more than 125 bitmap manipulating programs. These files are available from various sources on the Internet (see "Browsing The Internet") in source code format. They are also available (with many other tools) in the book *UNIX Power Tools* by Jerry Peek, Mike Loukides, Tim O'Reilly, and others. It comes with a CDROM that has both sources and compiled versions of the programs for several platforms including the HP 9000/700 series. The PBM utilities take and create many different file formats, including TIFF, PCX, PICT, XBM, XWD, and so on.

Rather than talk about every utility program in the collection, I'll point out the most commonly used programs and some of their features. The first step is to explain the four formats (there is a man page for each format):

**PBM:** Portable BitMap format, the black-and-white format. The files can be quite large since they are completely ASCII, using two characters to represent 1 bit from the original map.

**FIGURE 6A: Normal image**

Continued



**PGM:** The Portable Gray Map format, also a simple ASCII file but with each pixel represented by a number from 0 to 255, where 0 = black, 128 is 50 percent gray, and 255 is pure white.

**PNM:** Portable AnyMap; programs using pnm understand all the different file formats (pbm, pgm and ppm).

**PPM:** Color pixel map format. Like the pgm format, each color is represented as a value, from 0 to 255 but each pixel now requires three numbers, one each for red, green and blue, respectively. This is the largest format with even small files (like Figure 1b) occupying from 1.4 to 8 megabytes, depending on the compile-time options used. These files are 24-bit color in desktop publishing terms.

So the first task is to convert from xwd to ppm and then look at other options. Here's the simplest form:

```
xwd -frame | xwdtopnm | pnmtotiff > myscreen.tif
```

which provides TIFF output, ready for most desktop systems. If the destination is a Macintosh, the PICT format is more common and the incantation would be:

```
xwd -frame | xwdtopnm | pnmto pict > myscreen.pict
```

Now, how about some manipulation of the images? Well, we first need a viewer to see what the results might be, and with HP-UX 8.07 and now on 9.0, the program `imageview` can be used to view the results. Figure 2 shows the picture from Figure 1 displayed in an `imageview` window. HP also offers a package called `MPower` that adds even more features for viewing graphics images.

Lacking any of these tools, you can always use `xwd` as the viewer. It is quite possible to route the image all the way to its final format (e.g., PICT) and then run the result back to `xwd` for display to see that all is well. This can be a bit slow on smaller computers like the 300s. Here is an example routing the PICT file all

the way back to the screen:

```
picttoppm < my_pict_file |  
pnmtoxwd | xwd
```

How about seeing the same image rendered as a gray-scale image?

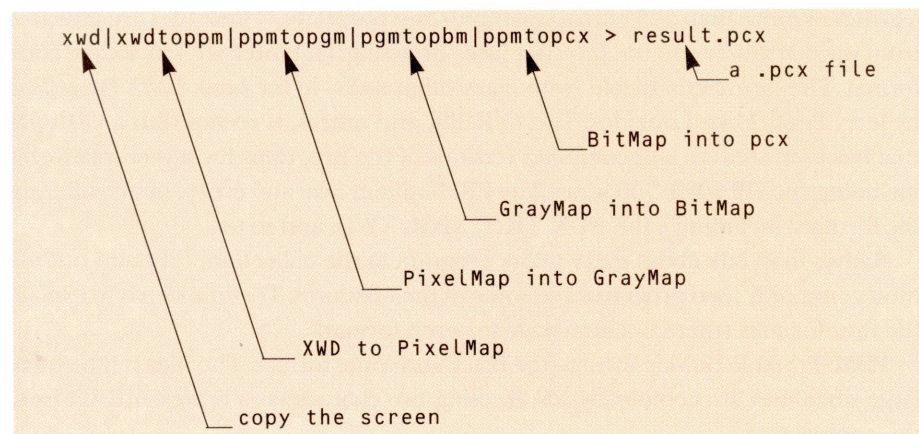
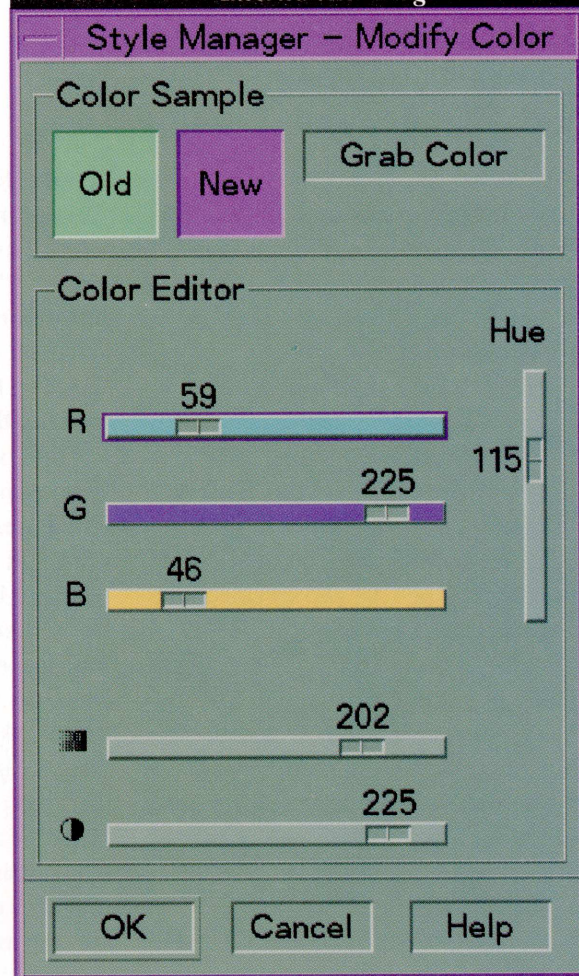
```
picttoppm < my_pict_file |  
ppmtopgm | pnmtoxwd | xwd
```

and the result is a grayscale image.

What about converting files that are originally in color but are going to be printed in black and white? PGM is the name of the Portable Gray Map format. Conversion to black and white is shown in the box on the left.

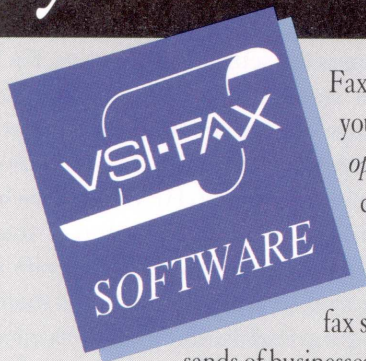
In this example, all defaults have been taken for each conversion and the result

FIGURE 6B: Inverted color image





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is a patterned gray tone image as seen in Figure 3. As you browse through the man pages for each utility, you will see there are many useful and intriguing options for each step.

What else can we do with the images? How about rotating the image?

```
xwd | xwdtoppm | pnmrotate 25 | ppmtopcx >
result.pcx
```

The two images are Figures 4a and 4b. If you begin playing with rotations, you will see an interesting property in performing the rotation: the number of apparent colors will expand tremendously, from as few as 100 unique colors as in the the example, to over 11,000 in the rotated image. The reason has to do with the rotation algorithm and the approximations that must be made to perform the translation mathematically.

That brings us to to another useful utility, ppmquant. This program will reduce an extreme range of colors to a smaller set, picking the nearest colors in the process of color reduction. In the rotated image above, ppmquant 200 was used to reduce the 11,000 colors to only 187. In Figures 5a through 5c, the 5a is normal while the 5b has been run through ppmquant 16 and 5c through ppmquant 8 to show the results of limited

color mapping. Here are the commands:

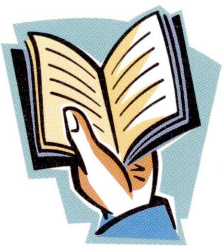
```
xwd | xwdtopnm | ppmquant 16 | ppmtopcx >
my_color16.pcx
```

You can even invert the colors with the routine pnminvert. Figure 6a and Figure 6b show the results.

As you can see, this is only scratching the surface of what is possible using X Windows and some simple utilities. The key is to get the image into an interchangeable format without losing any of the data along the way. Remember that once your PCX or TIFF or PICT files have been created, they must be transferred to the PC or other desktop publishing system with binary methods! Be sure to set a binary transfer option when you send these files to your editor or publisher. ■

*Bill Hassell is an HP-UX system support engineer at the HP Atlanta Response Center. He can be contacted at his e-mail address, which is [blh@hpuerca.atl.hp.com](mailto:blh@hpuerca.atl.hp.com).*





# Book Review

by Paul Carella

HP-UX SYSTEM ADMINISTRATORS NO longer have to rely exclusively on the HP-UX manual set or general UNIX administration books written for System V or BSD. *The HP-UX "How-to" Book For System Administrators* by Marty Poniatowski covers every topic an HP-UX system administrator needs to know including system setup, the System Administration Manager (SAM), performance, and shell programming. Examples are provided throughout the book for both workstations (Series 700) and multi-user (Series 800) systems, so every HP-UX system administrator will benefit from this book.

The book begins with system setup. General UNIX administration books assume you have already set up your system(s) before covering administration. It is, however, unlikely you'll do much setting up without knowing some UNIX system administration. Because this book

covers HP-UX system administration exclusively, it provides insider's information that relates specifically to your system. The setup information is provided through a flow diagram that shows the steps for setting up a system. Each of the steps is then dissected and the appropriate background is provided. This chapter removes a lot of the mystery about setting up HP-UX systems by providing a plan for the setup of your system while explaining the ramifications to the system of decisions made during the initial installation. This information will be helpful to you, whether you perform the setup yourself or have the setup performed for you.

The SAM is next covered. SAM is a useful tool for performing routine system administration tasks but it doesn't have an intuitive interface. Since there is no HP-UX manual devoted to SAM, this chapter helped answer a lot of my questions about SAM and is alone enough to justify having the book. For each of the top level menu picks in SAM, such as "Users and Groups," a diagram is provided that shows the hierarchy of the command and what actions can be performed for each menu. Especially useful is the author's explanation about what SAM is actually doing to your system and how to check that SAM did to your system what you intended. The chapter is appropriately named "The Science Of System Administration," since not too much creativity is required to run SAM, and the author covers the use of SAM to perform everyday system administration tasks such as adding and deleting users, performing backups, viewing the status of disk space, etc.

<b>Title</b>	The HP-UX System Administrator's "How-to" Book
<b>Author</b>	Marty Poniatowski
<b>Publisher</b>	Prentice Hall
<b>Price</b>	\$32.00

To order, or for information on discounts for customers bundling *The HP-UX System Administrator's "How-to" Book* with a product, contact:

Maureen Larkin  
Prentice Hall  
Corporate Sales  
113 Sylvan Avenue  
Englewood Cliffs, NJ 10732  
Fax 201-592-2249



The next chapter covers understanding how your system resources are being used. The title is "The Art Of System Administration," since much more creativity is required to play detective in determining how system resources are being used. This is mostly a performance monitoring chapter that will help you gain insight into your system you never before had. There are three topics covered that help take the mystery out of getting a handle on how your system resources are being used. First, HP-UX commands such as `vmstat`, `iostat`, `netstat`, and others are decoded by the author so you'll know how to use these *and* how to interpret the results. Next, built-in HP-UX accounting is covered. This includes how to enable accounting and how to understand the daily and monthly reports you'll receive. The last topic covered is HP GlancePlus/UX, a performance monitoring tool that is one of the few add-on tools covered in the book. You need this chapter if you don't have a good understanding of how much memory, CPU, disk, networking, swap, and other resources are being used on your system.

Rather than clogging up earlier chapters by shoe-horning in a topic where it doesn't belong, the author provides a catch-all chapter for system administration topics that don't fit naturally into one of the previous chapters. One topic of particular interest in this chapter is DOS and HP-UX integration. We're all performing at least some connectivity between DOS and HP-UX, even if it is just transferring files between the two, and the author provides some good basics on this and other topics.

The book ends up with a chapter on programming. Every system administrator ends up performing some shell

programming at some point. The author recognizes this and provides the basics of shell programming (actually written by an HP education center instructor) so that you can perform the basics without having to refer to another book or manual. This chapter also has a section on HP-UX programming tools (written by yet another HP education center instructor) such as `make`, because most HP-UX administrators end up either using these or answering questions about them.

The author has obviously spent a lot of time in the field working with HP-UX customers because he addresses what HP-UX system administrators really need to know.

This book is a must-have for HP-UX system administrators. Chapters such as the one on SAM fill the gaps in the HP-UX manual set. At the same time the book does what no other general UNIX book does—covers HP-UX-only topics such as system setup. ■

*Paul Carella is a member of a software engineering and database management group in the Shipping and Weighing Systems division of Pitney Bowes Inc. The group has recently purchased one 720 HP Workstation server, four 705 HP diskless terminals, and a 64700 HP emulator, and they are presently in the early stages of migrating to the HP hardware and software environment.*

*Carella is one of two engineers involved in the purchase and setting up of the equipment and will be the initial user and administrator of the system. Previous UNIX experience includes software development and backup system administration responsibility on Intel 386 boxes running Interactive UNIX.*

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CIRCLE 20 ON READER CARD



# Sharing COM Between BASIC/UX and C

by *Stuart Beatty*

**HP-UX** is a multi-tasking OS, so it is not surprising to find users who want other processes running in concert with BASIC/UX. Some of these programmers want to use the C language for these other processes. Using existing documentation, programmers can explore the use of CSUBs or EXECUTE commands to pursue these goals. However, they might find some shortcomings:

- CSUBs execute in a “serial” fashion. First BASIC/UX runs, then the CSUB runs, then execution returns to BASIC/UX, and so on. This is not true multi-tasking.
- CSUBs can share data with BASIC/UX, but they also share many signals. Handling (or even ignoring) these signals often adds unwelcome complexity to the CSUB.
- EXECUTE commands can be run in the background for true multi-tasking, and they are free from the signal issues. However, there seems to be no fast mechanism for sharing data. Without access to BASIC’s variables, the relatively slow file system is the only available IPC mechanism.



This article documents a technique that allows EXECUTE commands (or even totally independent C processes) to share the COM area with BASIC/UX. This provides high-speed, two-way exchange of data, multi-tasking, and freedom from unwanted BASIC/UX signals.

This technique relies on certain externals from the BASIC/UX source code and permission to access BASIC’s shared memory segment. A potential hazard is that future versions of BASIC/UX might change the names of these externals or might deny access to shared memory. Of course, it might work the same in

future versions. To ease your mind, this technique has worked unchanged for three versions of BASIC/UX: 5.52, 6.2, and 6.3.

## Step-by-Step Procedure

In overview, the technique is to get some special numbers from a CSUB, then pass them to a C routine with an EXECUTE command. If this C routine is run in the background, multi-tasking occurs. The special numbers are the ID of BASIC’s



shared memory segment and the location of COM within that segment. The details follow.

### Step 1: A CSUB to Find COM

#### WHAT'S HAPPENING HERE?

This CSUB is a simple extension of the `find_com` technique described in the "Accessing BASIC COM from a CSUB" section of *Developing CSUBs for HP BASIC/UX*. Before diving into the pointer arithmetic, let's look at the goal.

Data in HP-UX shared memory can be used by more than one process; that's why they call it shared memory. But all access must occur inside the process address space. HP-UX provides the routines necessary to attach a shared memory segment to an accessible process address. This attach point is the *bottom* of the shared memory segment. As it happens, BASIC/UX puts its COM space near the *top* of shared memory. Therefore, having a pointer to the bottom of shared memory is not sufficient to give another process access to COM.

Although two processes may be using the same shared memory, there is very little chance that they will be seeing it at the same process address. The `find_com` function gives a process address for the COM block. By itself, this address is useless in another process space. So the `find_com` pointer is also not sufficient to give another process access to COM.

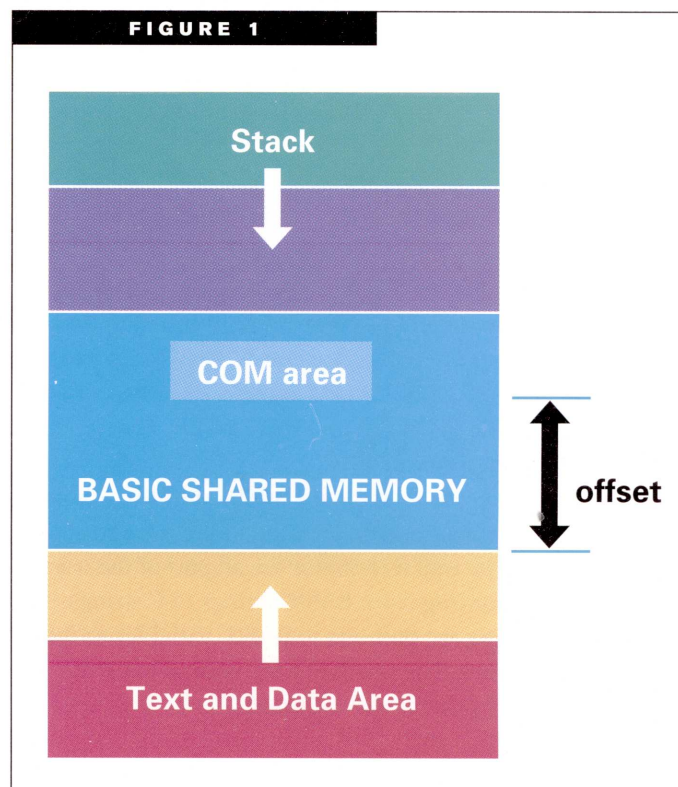
Now the good news. The difference between the bottom of shared memory and the `find_com` address is useful to another process. If two processes attach to the same shared memory segment and look at the same relative address within that segment, they will be looking at the same data. This is our goal.

The diagram in Figure 1 shows a typical BASIC/UX process address space.

The dimension called "offset" is the difference between the beginning of COM and the beginning of shared memory.

#### GETTING THE CORRECT SHARED MEMORY SEGMENT

There can be many shared memory segments in HP-UX. It is important to find the one that our BASIC/UX process is using. Shared memory segments are identified by a simple integer called a shared memory ID. The only way to know the



proper ID is to ask BASIC. To do this, it is necessary to access an IPC structure declared in BASIC. The C code is:

```
typedef struct {
    int  proc_id;
    int  gshm_id; /* global shared memory id */
    char *gshm_loc; /* global shared memory address */
    int  gshm_size;
    int  himsg_id;
    int  sem_num;
} ipc_struct;
extern ipc_struct ipc_info;
```

Once this external is declared, the shared memory ID is simply:

```
ipc_info.gshm_id
```

#### CALCULATING THE OFFSET

The `find_com` function provides the process address of the beginning of a COM block. The process address of the beginning of shared memory is a field in the `ipc_info` structure



mentioned previously. The difference between these two addresses is the offset to be used by our independent C process.

Pointer arithmetic is unavoidable in this task. In the following example, the name of the COM block is entered as a literal.

```
comptr = find_com("Foo");
offset = (int) comptr - (int) ipc_info.gshm_loc;
```

### COMPLETING THE CSUB

The task is completed by writing a CSUB function that can receive the name of the COM block from BASIC/UX and pass back the ID and offset. The COM name is passed as a BASIC string variable. The ID will fit in an INTEGER, but the offset will not, so a REAL is used.

Some of the necessary steps are outlined in the following example. The first two parameters, the name\_type structure, the strncpy, and the null terminator are all part of the normal overhead when moving from BASIC strings to C strings. The last two parameters are pointers to BASIC variables so that C can pass back values. The result of find\_com needs to be tested to see if a valid pointer was returned.

```
extern char* find_com();
typedef struct { shortint len;
    char c[16];
} name_type;

findipc(dim_len, com_name, shmid, offset)
dimentryptr dim_len;
name_type *com_name;
binteger_parm shmid;
breal_parm offset;
{
    char *comptr, namestr[16];

    strncpy(namestr, com_name->c, com_name->len);
    namestr[com_name->len] = '\0';

    comptr = find_com(namestr);
    if (comptr) { /* COM found */
        /* pass back appropriate data */
    }
    else { /* COM not found */
        /* pass back an error indicator */
    }
}
```

The examples shown thus far are just "code snippets," not complete C programs. The last section in this article shows all these pieces combined into a usable CSUB. This CSUB is compiled and prepared normally (see "Writing C and Assembly CSUBs" in *Developing CSUBs for HP BASIC/UX*).

### Step 2: A C Process to EXECUTE

Now let's look at the C process that will be spawned by the EXECUTE command. It must do several tasks:

- receive the shared memory ID and COM offset value from the command line
- define a structure that is equivalent to BASIC's COM declaration
- attach BASIC's shared memory to its process space
- perform the desired operations using the COM data

Receiving parameters from the EXECUTE command is done with the standard argv mechanism. (The offset value must be a REAL in BASIC because it is probably greater than 32k, but it can be an int in C because it will be less than 2 billion.)

```
main(argc,argv)
int argc;
char *argv[];
{
    int shmid, offset;

    if (argc == 3) {
        sscanf(argv[1], "%d", &shmid);
        sscanf(argv[2], "%d", &offset);
    }
    else {
        /* syntax error in EXECUTE command */
    }
}
```

The techniques for declaring a C structure that matches a COM block are discussed in "Accessing BASIC COM from a CSUB" in chapter 3 of *Developing CSUBs for HP BASIC/UX 6.2*. Also see the file */etc/newconfig/rmb/README.FIRST*. In the example at the end of this article, the COM block is defined as:

```
COM /Foo/ INTEGER Ready,REAL Data(0:1000)
```

The corresponding C definition is:

```
typedef struct {
    brealvaltype data[1001];
    bintvaltype ready;
} *comtype;
```





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**CIRCLE 47 ON READER SERVICE CARD**



Two steps are needed to get a pointer to this COM area. First, shmat maps the shared memory segment into process address space. Next, the offset is added to move the pointer to the COM block. Using a pointer to char simplifies the pointer arithmetic. It is cast to the proper type before it is used.

```
#include <sys/shm.h>
char *shmptr;
comtype comptr;

shmptr = shmat(shmid, (char*)0, 0);
shmptr = shmptr + offset;
comptr = (comtype) shmptr;
```

These COM sharing techniques can be merged with your favorite C algorithms. The result is a C program which is compiled and linked like any other stand-alone C program. Do not run rmbuildc with this program. It is run with an EXECUTE command, not a CALL command.

### Step 3: Cooperation Between BASIC/UX and a C Process

If BASIC/UX and a C program will be running simultaneously with the same data, some formal cooperation is needed between them. This might include agreements about "locking" certain data, the ability for BASIC to signal the C process, and other communication that is appropriate to your application. Shared memory is one good way to achieve interprocess communication. A shared memory link is already established between the two processes using COM. A couple of examples of using that link are presented in this section. The rest is up to your imagination.

#### WATCHING C START

It is helpful for BASIC to know when the C process starts successfully. One technique is to use a COM variable as a status indicator. BASIC zeros this variable, then spawns the C process, then watches the variable for a non-zero value placed there by the C process. The following code segment demonstrates this. (The exact content of Command\$ is shown in the full program at the end of this article.)

```
10 COM /Foo/ INTEGER Ready,REAL Data(0:1000)
.
.
100 Ready=0
110 EXECUTE Command$
120 WHILE Ready=0
130 WAIT .04
```

```
140 END WHILE
150 ! Continue processing
```

As an aside, notice the use of WAIT .04 in this loop. This is not a requirement, but it is a good general technique. BASIC/UX consumes a disproportionate amount of CPU if it runs a tight loop. Adding a small WAIT releases a lot of CPU, and causes no significant decrease in BASIC's response time.

#### SENDING SIGNALS FROM BASIC/UX TO C

If the C program puts its Process ID number in the Ready indicator, then BASIC/UX will be able to send it signals using statements such as:

```
EXECUTE "kill -22 12345"
```

Assuming the declarations shown earlier, the C statements to report my PID are:

```
mypid = (bintvaltype) getpid();
comptr->ready = mypid;
```

#### INTEGRITY OF THE COM POINTER

BASIC/UX creates (and positions) COM at pre-run time. The offset returned by the find\_com procedure will be valid as long as no pre-run occurs after the offset is calculated. The only time there is another pre-run in a running program is after a programmatic LOAD or GET. (LOADSUB should be OK.) Therefore, do not use LOAD or GET statements in any program employing this shared COM technique, unless you are willing to repeat the find\_com and EXECUTE steps.

#### DATA SHARING PROTOCOLS

As you share COM data, remember that the BASIC/UX process and the cooperating C process are running simultaneously. You need some protocol to regulate access to the shared data and avoid collisions in the shared area. For example, it is not good if both processes write to the same variable at the same time. You also want to avoid getting half new data and half old data because one process was reading a block of data while the other was updating that same block.

The simple case is "one-way" data: one process writes the data and sets the flag; the other process reads the data and clears the flag. For this, it is possible to use a variable in COM as a flag. Just ensure that neither process accesses the data until the flag is in the proper state.



Applications that allow both processes to write the same data require a more formal protocol. It is not reliable to use a simple "in-use" flag. Problems arise unless the testing and setting operations of one process can both be completed without any interference from another process.

If your application requires this type of protocol, a more reliable IPC mechanism must be used. HP-UX semaphores are designed to avoid synchronization problems while testing and setting flags. A thorough discussion of semaphores is beyond the scope of this article. There are lots of details and some examples in the man pages for the semaphore functions.

The general program flow for using semaphores is summarized in the following pseudo-code:

Cooperating Process	CSUB
Create/Get Semaphore	Read Semaphore ID from COM
Initialize Semaphore	Acquire Semaphore
Put Semaphore ID in COM	Operate on Shared Data
Loop	Release Semaphore
Acquire Semaphore	
Operate on Shared Data	
Release Semaphore	
Operations that Don't Use Shared Data	
End Loop	

## An Example Program

Most of the shared COM techniques have been discussed in the preceding sections. In Listings 1, 2, and 3 they are shown in the context of complete example programs. Three programs are included:

- the BASIC/UX program that declares COM and spawns a C process in the background (Listing 1)

- the CSUB that identifies the key numbers needed to find that COM area (Listing 2)
- the C program that runs simultaneously with BASIC/UX and shares the COM area (Listing 3)

The BASIC program in Listing 1 simply places the value PI in a shared array element to demonstrate the connection. All the techniques have been discussed except the Command\$ string. The goal is to EXECUTE a command that looks something like this:

```
myproc 33 1040855 &
```

A formatted OUTPUT to the string and concatenation are used to assemble such a command. The "10D" format is needed because the offset is a REAL in BASIC, but an int in C.

The CSUB uses techniques discussed previously and some that are discussed in *Developing CSUBs for HP BASIC/UX*. It is given in Listing 2.

The C program in Listing 3 simply establishes the connection with BASIC/UX and reads one element from an array. (Obviously, the goal would be something more significant in real life.) This file is compiled to become myproc. Notice that IDs and pointers are checked for validity before they are used. The Listings begin below and continue to page 37. ■

---

*Stuart Beatty is a Tech Support Engineer at the VXI Systems Division of Hewlett-Packard in Loveland, Colorado. In his 16 years at HP, he has written manuals, developed software, taught classes, and done online support. His software experience includes HPL, Pascal, BASIC, and C. He currently specializes in HP-UX software on HP Series 300/400 and 700.*

### LISTING 1

```
100 COM /Foo/ INTEGER Ready,REAL Data(0:1000)
110 INTEGER Shmid
120 REAL Com_offset
130 DIM Command$[80]
140 !
150 ! Get key information about COM block
160 CALL Findipc("Foo",Shmid,Com_offset)
170 !
```

*Continued*



# LISTING 1 (CONTINUED)

```

180 ! Prepare a command to be executed in the background
190 OUTPUT Command$ USING "#,10D";Com_offset
200 Command$="myproc "&VAL$(Shmid)&Command$&" &"
210 !
220 Data(0)=PI
230 Ready=0
240 EXECUTE Command$
250 WHILE Ready=0 ! Wait for spawned process to put its PID in COM
260     WAIT .04
270 END WHILE
280 !
290 PRINT "PID of new process = ";Ready
300 END
310 CSUB Findipc(Com_name$,INTEGER Shmid,REAL Offset)

```

# LISTING 2

```

/*
This CSUB is passed the name of a COM area. It finds the true
location of that COM area in shared memory. This location is passed
back as two pieces of data: the ID of the shared memory segment being
used by the BASIC process and the offset of the COM area above the base
address of that shared memory segment. Using that data, another process
can attach to the same shared memory segment and find BASIC's COM area. */

#include <csubdecl.h>

/* this ipc_struct matches the declaration used in BASIC/UX */
typedef struct {
    int    proc_id;    /* process id */
    int    gshm_id;    /* global shared memory id */
    char *gshm_loc;    /* global shared memory address */
    int    gshm_size;  /* global shared memory size */
    int    himsg_id;   /* human interface message queue id */
    int    sem_num;    /* number of semaphore segments allocated */
} ipc_struct;

/* this structure is needed to handle a short BASIC string */
typedef struct {
    shortint len;
    char c[16];
} name_type;

```

Continued



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**LISTING 2 (CONTINUED)**

```

/* important externals */
extern char* find_com();
extern ipc_struct ipc_info;

findipc(dim_len, com_name, shmid, offset)
dimentryptr dim_len;
name_type *com_name;
binteger_parm shmid;
breal_parm offset;
{
    char *comptr, namestr[16];

    if (com_name->len > 15) {
        /* longer parameter could not be a valid COM label */
        comptr = 0;
    }
    else {
        /* make a C-compatible string containing the name of the COM block*/
        strncpy(namestr, com_name->c, com_name->len);
        namestr[com_name->len] = '\0';

        /* use an external routine to locate this COM block */
        comptr = find_com(namestr);
    }

    if (comptr) { /* COM found; get the details */
        /* shared memory ID available with a simple look-up */
        *shmid = ipc_info.gshm_id;

        /* address offset involves some blatant pointer arithmetic */
        *offset = (int) comptr - (int) ipc_info.gshm_loc;
    }

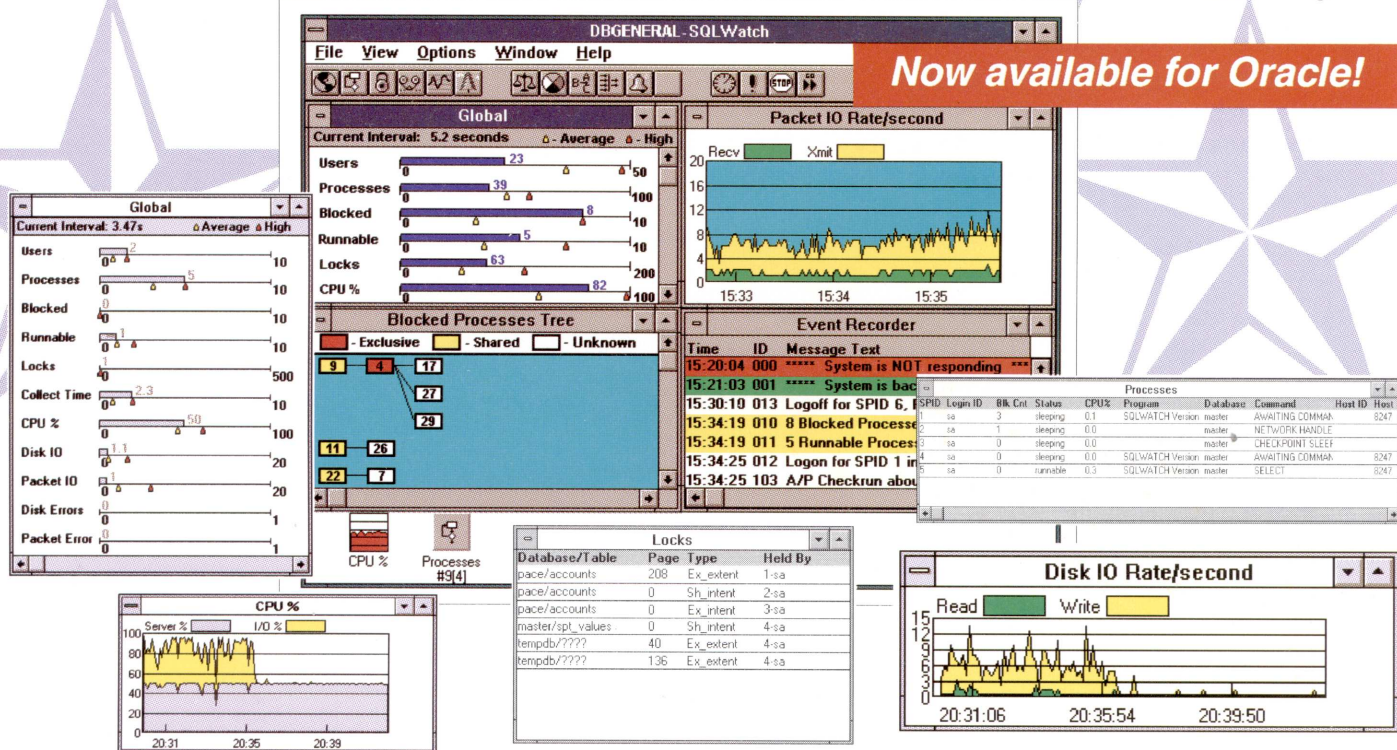
    else { /* COM not found; use -1 as a failure indicator */
        *shmid = -1;
        *offset = -1;
    }
}

```



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## LISTING 3

```

/*
This program is spawned by a BASIC/UX EXECUTE command. BASIC passes
an ID and offset which identify the location of a COM block. These
parameters are used to attach to the same shared memory segment as BASIC
and point to the COM area. Thus, this process can share the data in
COM, but it is not constrained to be a CSUB.
*/
#include <sys/shm.h>
#include <errno.h>
#include <csubdecl.h>

/* this structure must be an accurate reflection of BASIC's COM block */
typedef struct {
    brealvaltype data[1001];
    bintvaltype ready;
} *comtype;

main(argc,argv)
int argc;
char *argv[];
{
    int shmid, offset;
    char *shmptr;
    comtype comptr;
    bintvaltype mypid;
    brealvaltype value;

    if (argc == 3) {
        sscanf(argv[1], "%d", &shmid);
        sscanf(argv[2], "%d", &offset);
    }
    else {
        printf("Usage: %s sh_mem_id com_offset\n", argv[0]);
        exit(-1);
    }

    /* our Findipc CSUB used ID -1 to indicate that COM was not found */
    if (shmid<0) {
        printf("CSUB did not find BASIC/UX COM block\n");
        exit(-1);
    }
}

```

Continued



**LISTING 3 (CONTINUED)**

```
/* attach to shared memory using the ID passed to us */
shmptr = shmat(shmid, (char*) 0, 0);
if ((int) shmptr == -1) {
    perror("Failed to Attach Shared Memory");

    exit(-1);
}

/* a little pointer arithmetic yields the address of COM */
shmptr = shmptr + offset ;
comptr = (comtype) shmptr;

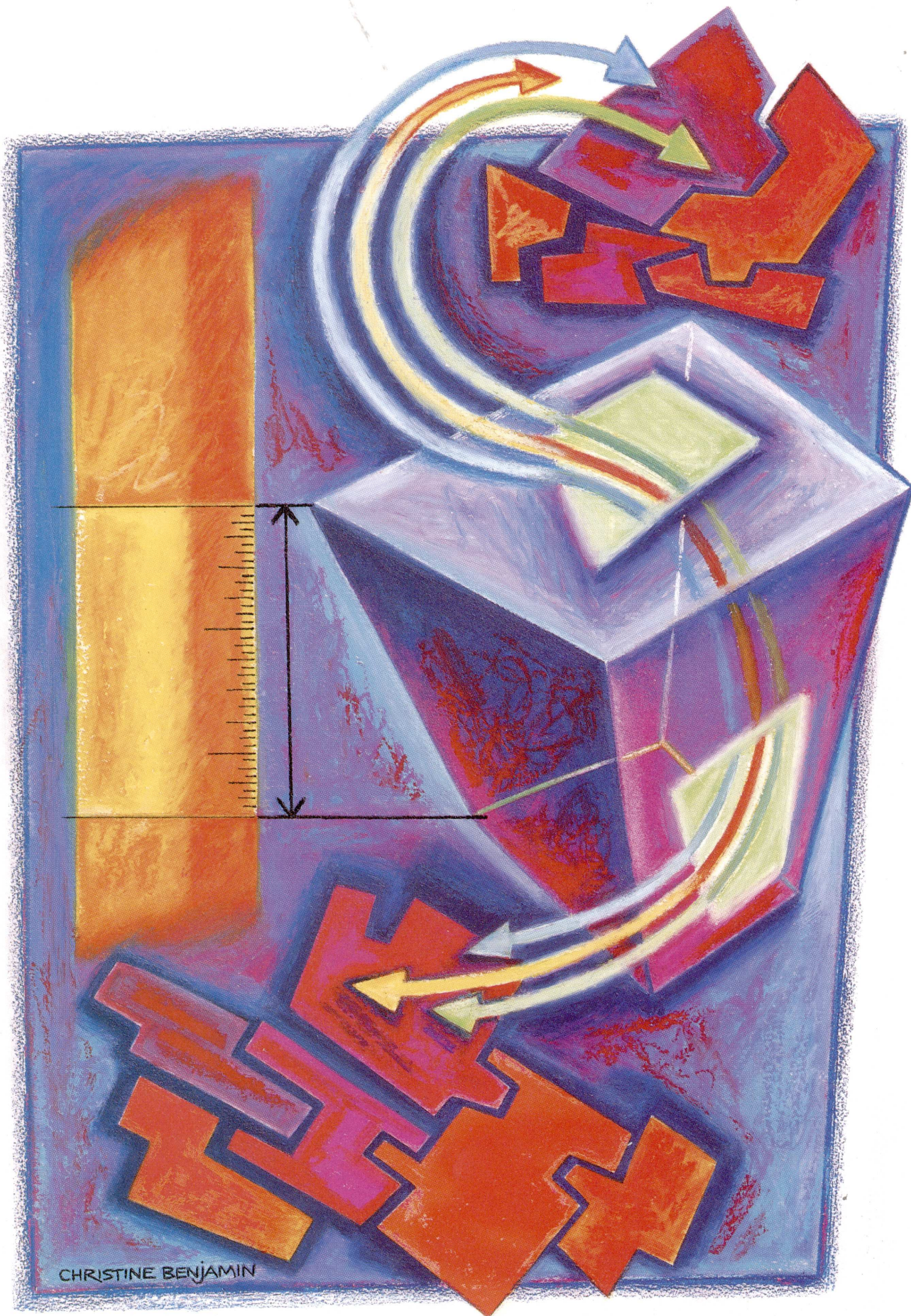
/*
Data can be written to BASIC's COM block. Here, we are giving BASIC
our PID in case it wants to send us any signals.
*/

mypid = (bintvaltype) getpid();
comptr->ready = mypid;

/* Data can be read from BASIC's COM block */
value = comptr->data[0];
printf("Value read from BASIC/UX COM block was %f\n", value);

/* we are now done with the shared memory: detach from it */
shmdt(shmptr);
}
```





CHRISTINE BENJAMIN



by Andres Llana, Jr.

# STRATEGIC RIGHTSIZING

*Large companies are gradually coming to grips with the issue of downsizing. Some companies that have tried it on a wholesale basis have had to back off, "reboot," and do an "Initial Restart"! These companies found that without a well-developed*

strategy, their efforts brought much turmoil, little productivity, and high costs. Smart planners have since found that by charting a very deliberate course through this technical sea of trouble, they could move away from their mainframe environments without losing the "farm." They learned that a successful strategy lay in the adoption of a well-developed plan for re-engineering the network and their applications software suite, and the establishment of a simple gateway from one environment to another.

The objective in re-engineering the network is to ensure that the transition from one protocol to another will be accomplished in a seamless manner without requiring large expenditures for redundant data communications equipment and facilities, and redundant installation costs. At a minimum, such an effort should result in establishing new points for communications control while containing long-term fixed costs.

Re-engineering applications software follows somewhat the same course of action. Because most large proprietary networks are SNA networks, the need for deliberate planning is even greater if migration to multiple computer platforms is to be successful! The charge here is to select a methodology to port applications to the new environment without incurring crippling expense. Since many applications in an SNA environment traditionally make extensive use of CICS (over 35,000 licenses worldwide), re-engineering efforts must focus upon cost-effective deployment strategies.



FIGURE 1

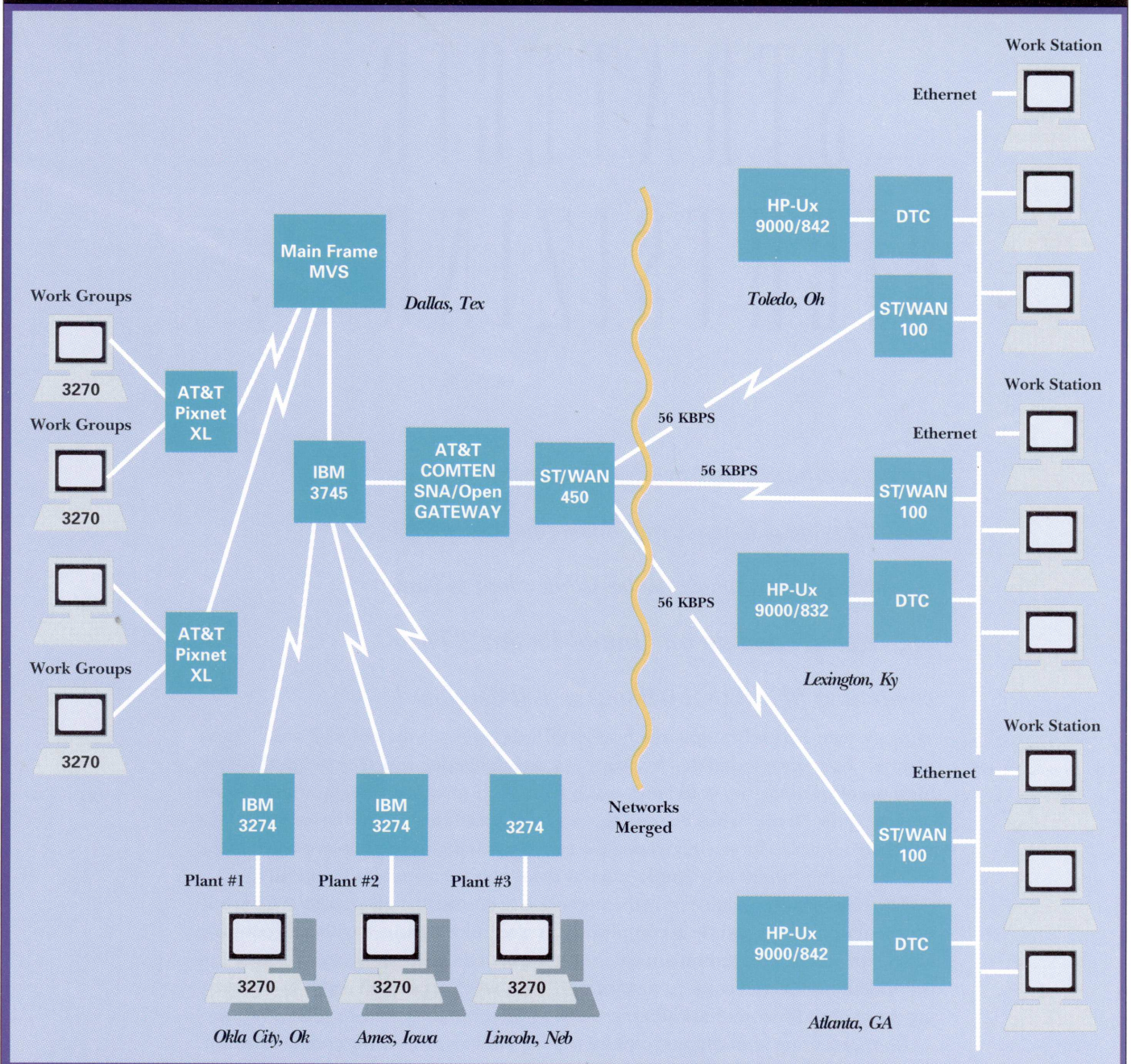


Figure 1 reflects the basic configuration of the network. Not shown are several warehouse and sales distribution centers that link through multiplexed or multi-dropped lines back to the mainframe computer in Dallas.



Selecting a simple gateway from one environment (SNA) to another, such as TCP/IP (Ethernet), poses a separate set of problems since such a move can spawn a complex array of gateway configurations. A cost-effective gateway strategy is imperative since success of the key elements already discussed above relies upon a cost-effective "gateway" solution. Solving these three key issues prior to making a move will avoid the costs associated with a "forklift" migration strategy involving platoons of programmers!

### Planning a Move for a Conglomerate

Large companies have come to the realization that the key to increased profitability is lowering the point of accountability and responsible decision making within their organizations. For that reason, P&L responsibility will appear lower down in the table of organization level (i.e., departmental, section, etc.) for these companies. These structures create a demand for more distributed computing down to the desktop or work center level. Hence, the driving force for what has become known as "rightsizing."

A large Texas-based company recently merged with a strong northern competitor, and had to face up to the all-too-familiar problem of integrating systems. One half of their pie is a dedicated SNA network, as shown in Figure 1, while the other half is an operational HP 9000/8XX Series network that easily costs only a third of the original SNA network! Downsizing, very much on the minds of the executive planning group blessed with uniting the two halves of the network, presented several dilemmas. For example, if either half of the equation made a wholesale move, the costs would be much higher than the advantage gained.

Migrating the Texas operations to an HP 9000/8XX series network would require rewriting much of the software on the SNA network. In addition, it would result in the sacrifice of an appreciable investment already made in IBM equipment. Further, expansion of the SNA network would require additional computer and terminal resources on both systems (i.e., HP SNA interfaces, emulation, etc.). Since the HP network is basically an Ethernet network (TCP/IP), a token ring interface into the SNA network via the twin IBM 3745s was also viewed as an expensive solution because it involved additional IBM resources. With downsizing a corporate priority, upgrading and expanding the existing SNA network would only result in wasted resources!

Further, since much of the applications software on the SNA network is customized to the operational requirements of the Texas company and not directly applicable to the operation of the acquired company, extending the full suite of applications software to the new acquisitions did not make sense. However, there was a requirement to unite the financial operations of both companies. Since the SNA financial applications have achieved a high degree of development, these would be extended to the newly acquired operating units. This requirement meant that SNA compatibility would have to be established across the HP network, which involved both equipment upgrades and programming efforts to merge the HP network users into the financial applications.

### Reaching a Gateway Solution First

Several gateway configurations were investigated involving various router, bridging, and emulation strategies. All of these configurations involved the

expansion of the current inventory of data communications equipment and the incurring of duplicate installation costs. Figure 1 shows the solution under consideration using AT&T/NCR's COMTEN SNA/Open Gateway. This solution provides both the hardware and software to allow the IBM 3270 terminals residing in the SNA network to operate across both networks. This strategy preserves the current investment in equipment, freeing resources to reposition the financial applications on the HP 9000/8XX UNIX-based systems. This move preserves the strategy for downsizing and minimizes long-term software re-engineering requirements. In effect, the SNA network can be gradually expanded into the HP network, providing an orderly migration path for "rightsizing" the three principal field locations in Oklahoma City, Oklahoma, Ames, Iowa, and Lincoln, Nebraska. While providing a direct interface with the SNA network, the COMTEN SNA/Open Gateway provides the connectivity between the FEP at Dallas via dedicated 56-KBPS DSO links and the three HP 9000/8XX hub locations in Charlotte, North Carolina; Toledo, Ohio; and Atlanta, Georgia. Through this connectivity arrangement, it is possible for SNA users with IBM 3270 terminals to sign onto each of the separate HP networks.

### Smoothing Out the Network

Since COMTEN SNA/Open Gateway provides a single gateway between both networks, it was possible to simplify the interface between the SNA network and the HP "smart" hubs through the application of a single router. In this application a Star/WAN 450 router provides routing between the three



HP-UX 9000/8XX Series "smart" hubs each equipped with Star/WAN 100 routers on the HP network. Through the establishment of dedicated 56-KBPS DS0 links between each of the three HP hubs as shown, the planners were able to establish full network diversity. It should be noted that although it is not shown in Figure 1, each of the three HP "smart" hubs is also linked to the others via dedicated 56-KBPS links. This arrangement provides a full mesh configuration between both the SNA and HP networks.

### Re-engineering the Financial Applications

As with any merger, there are always changes that have to be made to a company's applications programs. As was previously pointed out, uniting both companies on a single financial system involves the porting of programs resident on the SNA network into the HP network. This solution could potentially involve a major programming effort since there are big differences between UNIX and CICS applications, particularly where online transaction programs (OLTP) are involved. However, the UniKix integration software together with the COMTEN SNA/Open Gateway system greatly simplifies the porting of any CICS applications software into a UNIX environment.

In this case, the UniKix software integration system from Integrus can be used to port the company's well-developed financial applications into the HP-UX network. This strategy will allow assigned users with 3270 terminals on the SNA network to access financial applications running on the HP-UX UNIX machines located in Toledo, Lexington, and Atlanta.

## A Little Bit About UniKix

UniKix is a sophisticated software product that supports the porting of IBM COBOL applications operating under CICS on IBM mainframe computers to a UNIX operating environment. The porting process does not necessarily involve changing or altering the original source code, although there are provisions for making changes or modifications using the developmental capabilities that are part of the UniKix system.

UniKix emulates the functions of IBM's CICS and supports the CICS-API (applications programming interface) on UNIX. UniKix provides in effect an interface between the user and the UNIX operating system. Once UniKix is initiated, the user does not interact directly with the UNIX operating system but is under the control of the UniKix executive. This allows the application developer or end user to focus on an application's functions and logic. UniKix does not require a knowledge of UNIX in order to implement or port an application coming from an IBM system. UniKix provides a high-level implementation source for CICS applications programs. This includes full compatibility with commonly used CICS commands and such functions as file control, terminal control, and basic mapping support (BMS).

While UniKix is a mature product, Integrus has continued to offer new versions of it each year (the most recent is release 4.0). The UniKix design has been focused on very high performance online transaction programs (OLTP). UniKix is scalable across all SMP UNIX systems. Release 4.0 has been enhanced with optimizing algorithms for efficient processing of large numbers of production transactions on large UNIX machines. By reducing the number of

### How it All Works

In this application a single "black box" gateway (SNA/Open Gateway) provides options for the translation of information (EBCDIC) from one environment to another (ASCII). The SNA/Open Gateway appears to the host on the SNA side as both a communications processor (PU4) and a mainframe (PU5). Here, the SNA/Open Gateway connects to the SNA network via the INN link on the FEP, and in turn links the HP-UX Ethernet via a router (Star/WAN 450), a 56-KBPS DDS link, and a router (Star/WAN 100) on the HP network. When information is received by the SNA/Open Gateway, it is translated and then routed via the router to the appropriate destination.

The UniKix integration software resides on each of the HP-UX computers. UniKix provides an executive function in both environments that allows the user to interact with UniKix features and services. UniKix provides the capability to convert IBM COBOL programs incorporating CICS functions into UNIX COBOL/CICS-compatible programs on the HP-UX computers.

The conversion process is very basic. To implement the conversion process, CICS programmers must submit a clean listing (file) of their COBOL/CICS program to the UniKix system residing on the HP-UX platform. The UniKix system will then translate their program into a UNIX-compatible program. Special UniKix functions provide for source



messages and I/O requests, UniKix can be scaled to support an increased level of business production transactions. For example, a recent test showed UniKix to exceed the OLTP and elapsed batch processing time when compared to identical CICS applications running on an ES/9000-720.

The ability of UniKix to handle VSAM files on UNIX has been enhanced. UniKix can now handle a VSAM file of up to 16 GB. In addition UniKix now supports standard SYBASE relational DBMS. UniKix now supports CICS transaction processing using Oracle, Informix, and SYBASE RDBMS products on UNIX.

New integration functionalities have been added through UniKix XPU4 and XPU5 products that are used to support 3270 users and SNA wide area network integration with the mainframe. These features allow a user to offload portions of their mainframe applications suite into a UNIX environment while still providing accessibility for their older IBM terminals.

A new product, KixWorld, has been introduced that provides a single control point for all system management functions on one or more UNIX systems. For example, KixWorld provides a single system interface for administrative facilities, such as an interface to multiple UniKix systems, batch management facilities, system performance monitors, RDBMS systems, and security systems. A GUI interface is provided to all of these system management functions using X/Motif.

Integris is located in Billerica, Massachusetts. Their number is (508) 294-7960.

planners will be able to realize a more deliberate migration plan toward the corporate goal dedicated to a downsized distributed network.

### Simple But Effective Strategy

The application of the COMTEN SNA/Open Gateway is a simple but effective deployment of technology in an otherwise complex scenario. The use of a single gateway allows the corporate planners a means of preserving their present investment in mainframe technology while providing an avenue for rightsizing their enterprise network. In addition, it avoids the acquisition costs for SNA interface facilities on the HP-UX network since one software solution simplifies the re-engineering of software.

A single gateway makes it possible to avoid network management costs which might have been associated with a more complex solution involving routers, bridges, and special interfaces. This solution contains the cost of expanding the existing data communications inventory as well as the associated costs for maintenance. ■

program translation, BMS source migration, and data file migration, as well as a table manager function. In addition, there are screen generation, symbolic debugging utilities, and configuration management and system tuning facilities. While the porting with UniKix is not a "Chinese Copy" process, it can reduce re-engineering life cycle costs by 2 to 1 and as much as 6 to 1 in some cases. Since UniKix emulates IBM COBOL/CICS under UNIX, programmers needn't learn UNIX to convert their programs, and corporate planners can unify the company quickly under a single financial management structure. They will then be free to refine their plans for "rightsizing" their operations to the less expensive HP-UX platforms.

### Importance of a Rightsizing Pathway

In this application of a single gateway solution we can see the clear establishment of a pathway to support continued downsizing of the user's mainframe installation. Rightsizing a computer platform within the HP-UX 9000/8XX Series for the company's field locations (Oklahoma City, Ames, and Lincoln ) can proceed in an orderly manner. Here the continued use of some remote IBM 3270 terminals can follow as applications are transferred to the HP-UX computers. Over time the 3270 terminals will be phased out and replaced with less costly PCs that will be linked to the less costly HP-UX 9000/8XX Series machines. Through this process the corporate

*Presently a consultant with Vermont Studies Group, Inc., Andres Llana, Jr. is a nationally known writer on telecommunications topics. His technical and management career spans more than 30 years and includes positions such as manager, Advanced Plans and Computer Services for GE and RCA, where he was responsible for implementing a nationwide time-sharing center.*



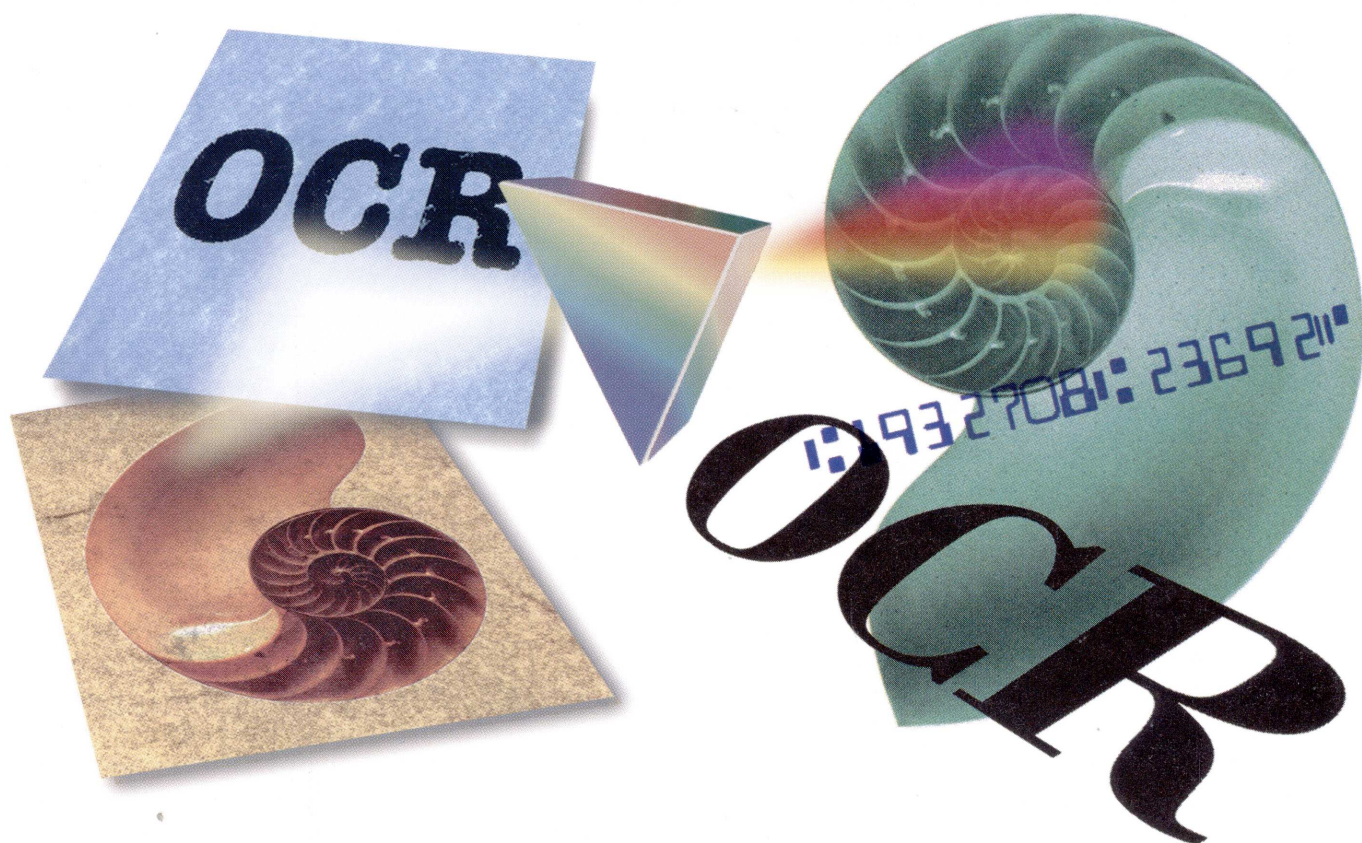


Illustration by Nea Biech

**I**maging systems such as Hewlett-Packard's Advanced Image Management System (AIMS) allow organizations of all types and sizes to move closer to a paperless office environment. By providing the means to scan paper documents into digital form and index them for easy storage and retrieval, such systems can automate workflow applications as diverse as insurance claims and loan processing, credit card and check processing, and the development and management of technical documentation and production schematics.

AIMS is a UNIX-based image management system that takes advantage of the client-server architecture (Figure 1).

All image processing functions are performed on HP Vectra PCs, or IBM PCs and compatibles, running MS-DOS and MS-Windows. Scanned images are displayed on high-resolution monochrome or VGA monitors. Optical character recognition (OCR) may be performed on images during the scanning process, allowing portions of the scanned image to be converted into ASCII text. Because the HP AIMS supports free text searching, the textual information may be used for indexing.

Hardware-based compression is used on the images before they are transmitted over the LAN. Images are stored on magnetic or optical disks attached to HP's

UNIX Dataserver and decompressed upon retrieval. The Dataserver controls central resources and holds the relational database on which images and other data types are stored. SQL is used for transparent handling of large data objects.

To use the AIMS software, each PC must be equipped with an Advanced Image Processor (AIP) card (Figure 2), which is a graphics coprocessor board that is needed to support many of the AIP Library functions. This card boosts the image processing capability and provides memory as well as high-bandwidth scanner and printer interfaces. It consists of a 32-bit processor optimized for graphics applications, compression/decompression



hardware, image memory buffers that provide video RAM for scanner and/or printer buffering and conventional RAM for images and working memory, and two I/O interface daughter boards with high-bandwidth interfaces for scanning and printing devices.

Software-only compression/decompression, called Soft AIP, is available when

have any knowledge of structure.

The AIMS database provides three ways of defining and handling BYTES (see Table 1):

- IMAGE: bit-mapped images such as scanned documents and photos or graphics
- ASCII: text as found in word processors

excluded from the index in order to improve search performance.

### ***Optical Storage Clustering***

To handle large objects, HP has completely integrated optical storage media into AIMS. Data on write-once, read-many (WORM) or rewritable optical disks is stored sequentially in the order

# A Nuts-and-Bolts look at HP's *Advanced Image Management System*

by Nathan J. Muller

high performance is less of an issue. Although this eliminates the need for the AIP board, it requires a 386 33-MHz computer for acceptable performance.

## **AIMS DataManager**

At the heart of AIMS is HP's relational database management system (RDBMS)—DataManager—which evolved from Informix Corp.'s database products through a joint development agreement between Plexus Software Inc. and Informix. The AIMS DataManager (Figure 3) is a superset of Informix TURBO and SQL with enhancements that permit the efficient handling of variable-length objects of up to 2 GB. This is achieved through the definition of two data types—BYTES and TEXT—and by extensions to the SQL interface.

The BYTES data type allows the efficient and flexible handling of unstructured objects such as scanned documents, digitized voice (for annotations) and pictures. Efficiency is improved because the database does not

and OCR processed documents

- BYTES: user-defined formats, such as digitized voice or sound

TEXT refers to structured objects such as programs, word processing documents, or other character-based information. The structure of these objects is used to compile an index that provides the basis for free text searches. TEXT may be stored in BYTE form if indexing is not important.

### ***Free Text Search***

Through the use of OCR, scanned documents can be converted into TEXT. Free text search on indexed objects allows selection based upon the occurrence of words, words in proximity to each other, words in sequence, word roots, phrases, and other parameters that are commonly associated with the Boolean search capability. Like most indexing schemes, provisions are also made for specifying a number of common words (*a, and, the, of*, etc.) to be

it is written and cannot be moved afterwards. In conventional optical storage systems, closely related objects, such as two documents in the same logical folder stored a few months apart, are often written to different platters. HP's optical clustering mechanism stores related objects on the same optical platter. This speeds up image retrieval by eliminating time-consuming platter changes that typically bog down I/O performance.

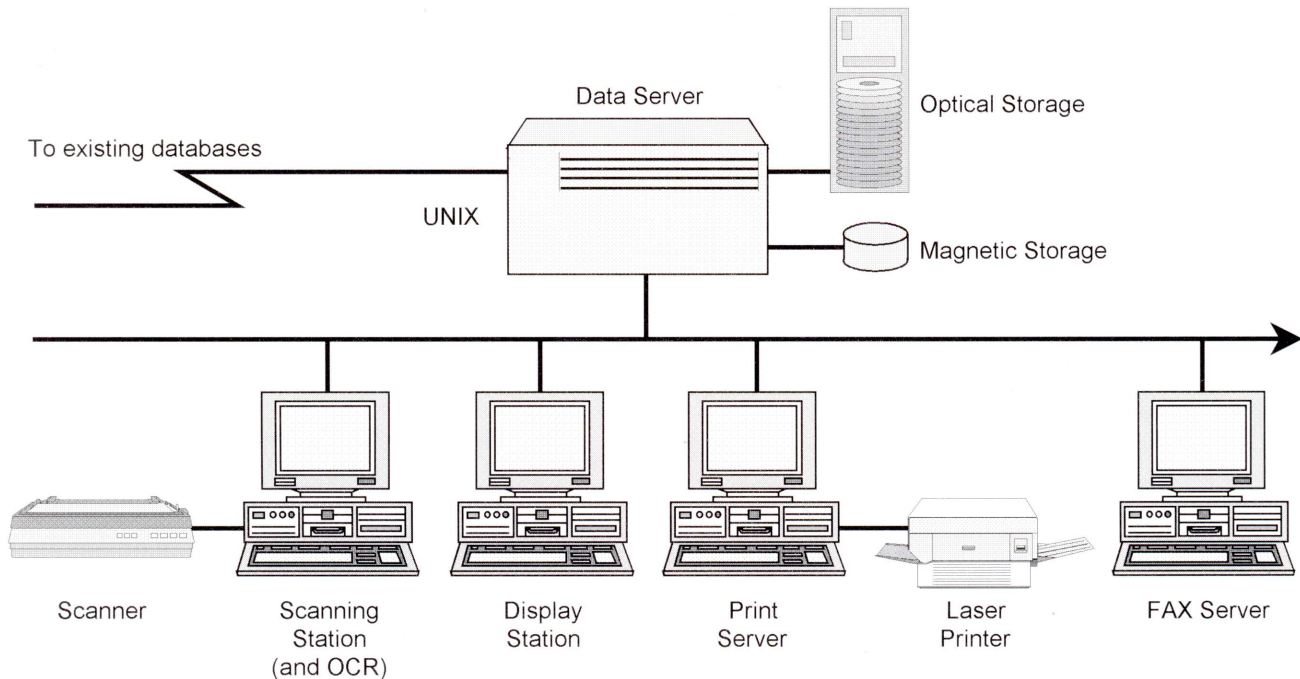
## **DataManager Modules**

The AIMS DataManager consists of two standard modules, TURBO and Interactive SQL (ISQL), and one optional module, Embedded SQL (ESQL).

### ***TURBO***

Developed for the UNIX online transaction processing (OLTP) environment, TURBO is the database engine that manages image storage and retrieval at high speed, ensuring a high level of data integrity. SQL calls are accepted from different client stations and translated



**FIGURE 1** AIMS Client-Server Architecture

via a data dictionary into disk accesses. Each client is given separate TURBO server processes dedicated to handling all database requests from that client.

In addition to being a database server, TURBO provides an operating environment for all database processes, which includes:

- disk space management
- built-in backup and recovery mechanisms
- systemwide view of resource allocation for overall performance optimization
- consistent interface for easy interaction with the environment system

Operation of the system is simplified and integrated at a single point of control, the TURBO Monitor. This is a

full-screen, menu-driven utility that allows database and/or system administrators to monitor, control, and modify the operating environment, thereby simplifying system definition and initialization. Among the functions available from TURBO Monitor are status, logging, checkpoint, backup, and recovery.

In addition, the following performance enhancements are provided and may be modified via TURBO Monitor:

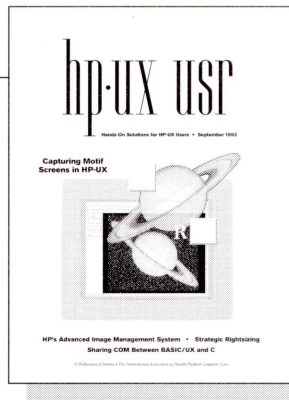
- Shared memory is provided between I/O and database processes to minimize disk accesses.
- Fast commits are achieved by flushing only transaction log records to disk immediately. Data is kept in shared memory and only written to disk at periodic checkpoints.

- Group commits optimize log file updates for several transactions at a time.
- Sorted writes also minimize disk access. At each checkpoint, the pages in shared memory are sorted contiguously, thereby minimizing disk access.
- Performance measurements may be taken and fine tuning performed while applications are running on the systems.

Several features are included to keep the availability and integrity of the data high. For example, after a system failure, automatic recovery of all databases occurs in a matter of minutes. This is achieved by restarting from a checkpoint and rolling forward according to the latest transaction log entry. Database consistency is maintained by "exclusive" or



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Note the following **IMPORTANT** points about preparing and word processing your text: The word processor of choice is Microsoft Word for Windows—or DOS Word, or Word for the Mac. WordPerfect 5.0 and 5.1 documents are next best. If not in one of these forms, your document should be straight ASCII text.

## WORD PROCESSING DOs AND DON'Ts

Microsoft word and wordperfect documents

- Keep the formatting simple. You can use boldface and italics and you can include headings to organize your article.
- FIGURES involving graphics (including screen dumps) should be sent as uncompressed TIFF or PCX. Your own laser print-outs of listings and code will be used as-is. TIFF and PCX files can be compressed with error detection and sent as e-mail.

## ASCII text

- The document should be a straight ASCII file. Most word processing packages include a utility that turns the text into an ASCII file. If your word processor has such a program, use it to prepare the file you send to the publications.
- Do not double space or right justify your text. LINE LENGTH no greater than 70 columns.

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**TABLE 1** *BYTES Usage*

NAME	ABBREVIATION	STORAGE FORMAT
BYTES used as Image	IMAGE	TIFF
BYTES used as ASCII	ASCII	Text File
BYTES for User-Defined Format	BYTES	Binary File

“shared locking” of database, table, page, or row during transactions. Applications can control the degree to which their transactions are isolated from the effect of other transactions by the setting of row read isolation levels:

- Dirty Read indicates that contents are not guaranteed stable.
- Committed Read indicates that contents are guaranteed stable.
- Cursor Stability indicates that a row is locked during examination.
- Repeatable Read indicates that a row is locked during transaction.

### *Interactive SQL*

The other standard module of the AIMS DataManager is ISQL, a tool for creating and modifying database structures as well as for designing non-Windows screen forms and menus and report formats. Entering and retrieving information is supported by the use of screen forms and files or through interactive queries. This makes ISQL suitable for ad hoc processing of databases by both end users and programmers who need a tool for applications development and prototyping.

The SQL enhancements that have been made to support compound data types are supported by ISQL, but with one caveat. Since ISQL runs only on the dataserver, with no graphics facilities, it

is not possible to retrieve the image of a data object and display it on a screen using ISQL. Another enhancement, the Select System option, allows ISQL to access any other data server on the LAN.

A full-screen, menu-driven user interface, ISQL consists of four modules:

- ISQL Main Module presents and runs the Main Menu with online help and offers database select/create, table select/create, table create/modify, and system select functions.
- Formbuild form generator and Perform form processor, together with an editor, offer the facilities required to specify and execute screen queries.
- Query, with an integral editor, is used to specify and run SQL queries, either one at a time or in sequence.
- Aceprep and Acego are used to specify and run a report with data from a selection of tables. Editing and management features are also available.

The complete menu structure of ISQL is provided in Figure 4.

### *Embedded SQL*

ESQL allows preparation of dynamic queries and SQL database manipulation directly from customized C Language programs on the dataserver. In addition to supporting all the standard SQL statements, a cursor control

statement is available to manage multiple row output from a SELECT statement. The cursor accommodates SQL statements in procedural languages. It is a pointer to the current row in the virtual table that allows the programmer to control the SELECTed data one row (record) at a time.

In most cases, the kind of database queries a user needs can be anticipated in advance. In some cases, the exact nature of a statement may not be known at compile time. ESQL and Tools for C (ESQL/C) provide a dynamic query facility whereby ad hoc ESQL statements can be specified and executed at run time.

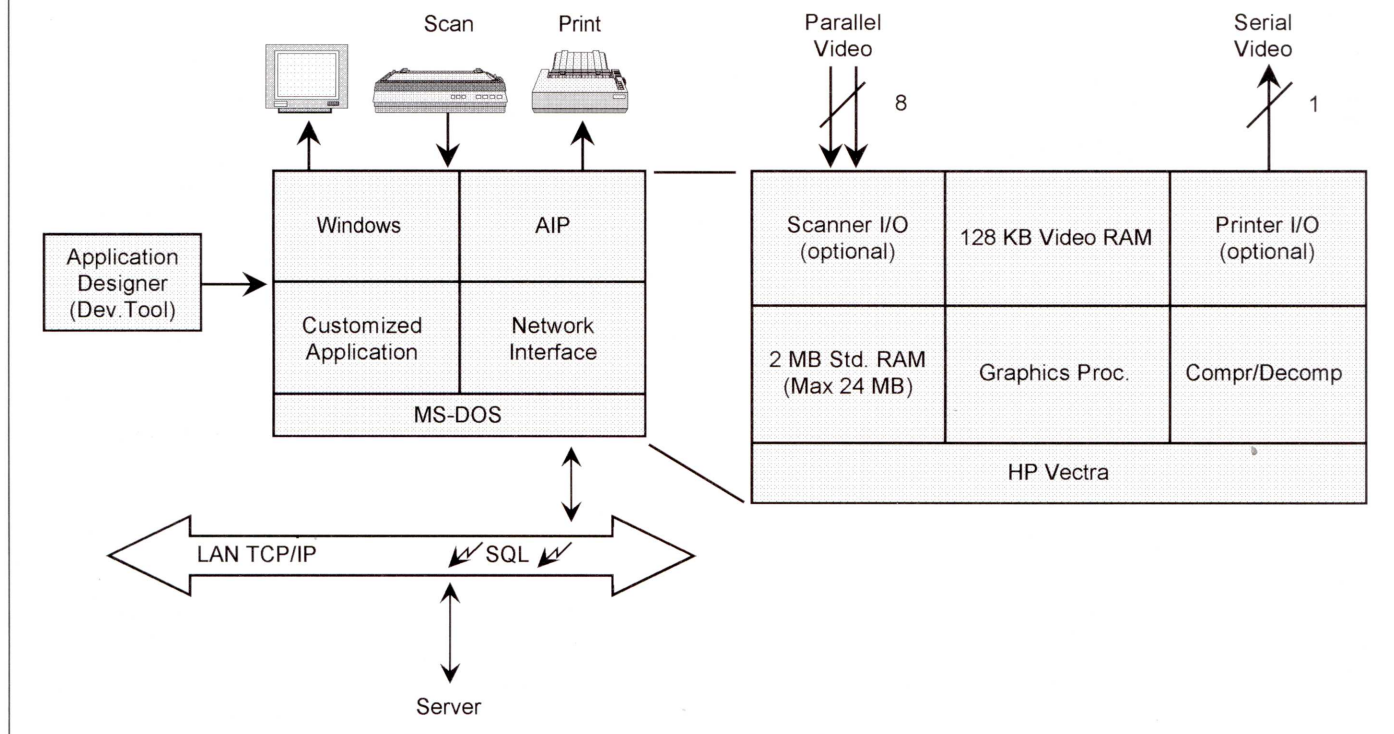
ESQL/C is a development tool for the C programmer, consisting of a compiler and library. The compiler is used during development only, while the library must be accessible during run time. The primary characteristics of ESQL/C include:

- allows SQL queries from C programs and routines
- performs conversions and manipulations on decimal, date, and string data types
- uses C Language utility functions
- uses C functions from the Ace and Perform programs within ISQL

### **AIMS MediaManager**

The MediaManager supports WORM and rewritable optical disks, both 5.25-inch and 12-inch sizes, for flexibility in designing systems based on individual business requirements. MediaManager also manages dismountable optical devices under AIMS and controls multiple optical drives—stand-alone or in jukeboxes. Resource reservation, scheduling, and queuing are transparent to



**FIGURE 2** HP's Advanced Image Processor

database management. With optical storage fully integrated into SQL, there are no syntax differences to reconcile, as long as the optional SQL extensions are not used.

The data on each side of an optical platter is called a "volume," with all volumes members constituting a "family." New volumes may then be added as the previous ones are filled. The system can handle a number of different families simultaneously. Sequential or clustered storage of images and/or large objects in BYTES format is supported.

Applications access data through standard SQL statements and do not need to know the family/volume location to find images or manage drives or platters. However, a volume configured on one AIMS system cannot be read in an alien

system without special provisions, since the data is part of the database and not an independent application.

In conjunction with the AIMS JukeboxManager, the Dismountable HP AIMS MediaManager (DIMMR) handles requests from the AIMS DataManager and controls and monitors optical media processes. It also maintains the family and volume table in the system.

The Dismountable Input-Output (DIO) controls the transfer of data between shared memory and optical drives on a SCSI bus (two DIO processes per drive). The AIMS DataManager controls the data stream between shared memory and the application. Optical write-data is temporarily buffered on magnetic disks to allow the application to proceed with the next task immediately.

The Dismountable Media Utility (DMU) prepares and manages optical disks for database use, accessed as family and volume. An AIMS volume contains only two partitions, "label" and "data." The UNIX utilities are not needed for normal AIMS use because the DMU provides the necessary services.

The DMU has a screen-oriented user interface, which shows the status of all drives, including jukeboxes, family/volume, reservation count, free space, and current user ID. There are 16 available commands, all listed, as well as online help that presents parameter and syntax information. Although screen-oriented, the commands may constitute or be part of UNIX script files.

HP offers a UNIX optical support package that consists of three elements:



UNIX optical device drivers, UNIX backup utilities, and dismountable media utility commands.

The drivers are used by the AIMS MediaManager, JukeboxManager, and UNIX utilities for optical disk access. Although the drivers are customized for each interface adapter/drive combination, the format of the DMU commands are still the same for all. Bad sector

reallocation is managed by the driver, and is completely transparent to the user.

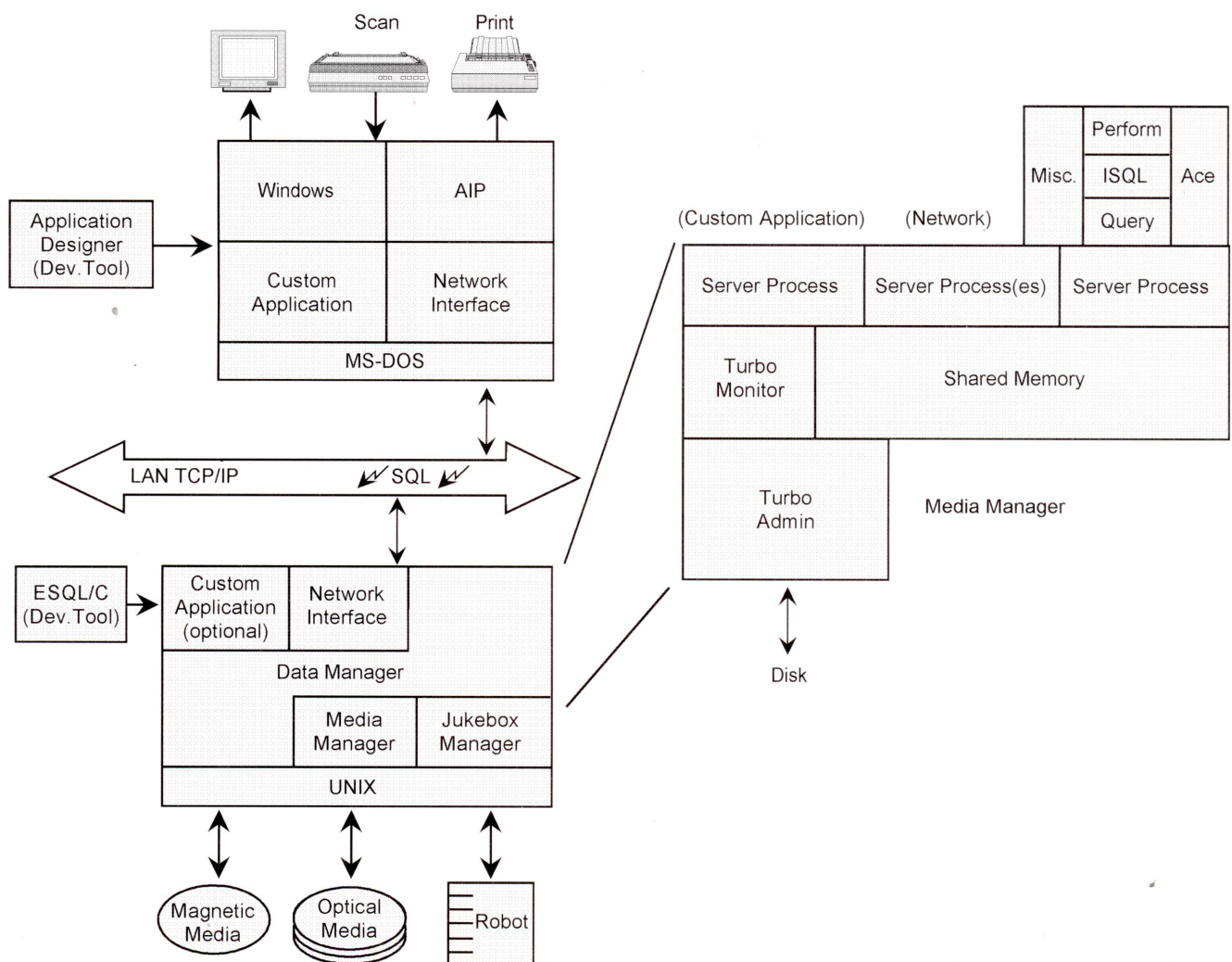
The backup utilities offer a variety of useful features such as copy and compare between platters and tape in any combination. The UNIX backup utilities apply only to WORM disks. The same features are available for rewritable disks using standard HP-UX commands.

As previously noted, the DMU prepares

and manages optical disks for database use. Among the utility commands are:

- Define/Drop drives in the system, in which case MediaManager's configuration table is automatically updated
- Shut down MediaManager, which halts all optical disk activity
- Create an optical family and volume on a blank platter

**FIGURE 3** AIMS DataManager





- Display statistics of families and volumes
- Examine a platter for type, family, and volume
- Mount/dismount an optical disk volume in a drive
- Add/subtract request for volume reservation
- Copy one platter to another, in which case a minimum of two drives are required
- Compare two platters, in which case a minimum of two drives are required
- Dump contents of platter to tape
- Restore/update contents of platter from tape
- Display written sectors within a specified range

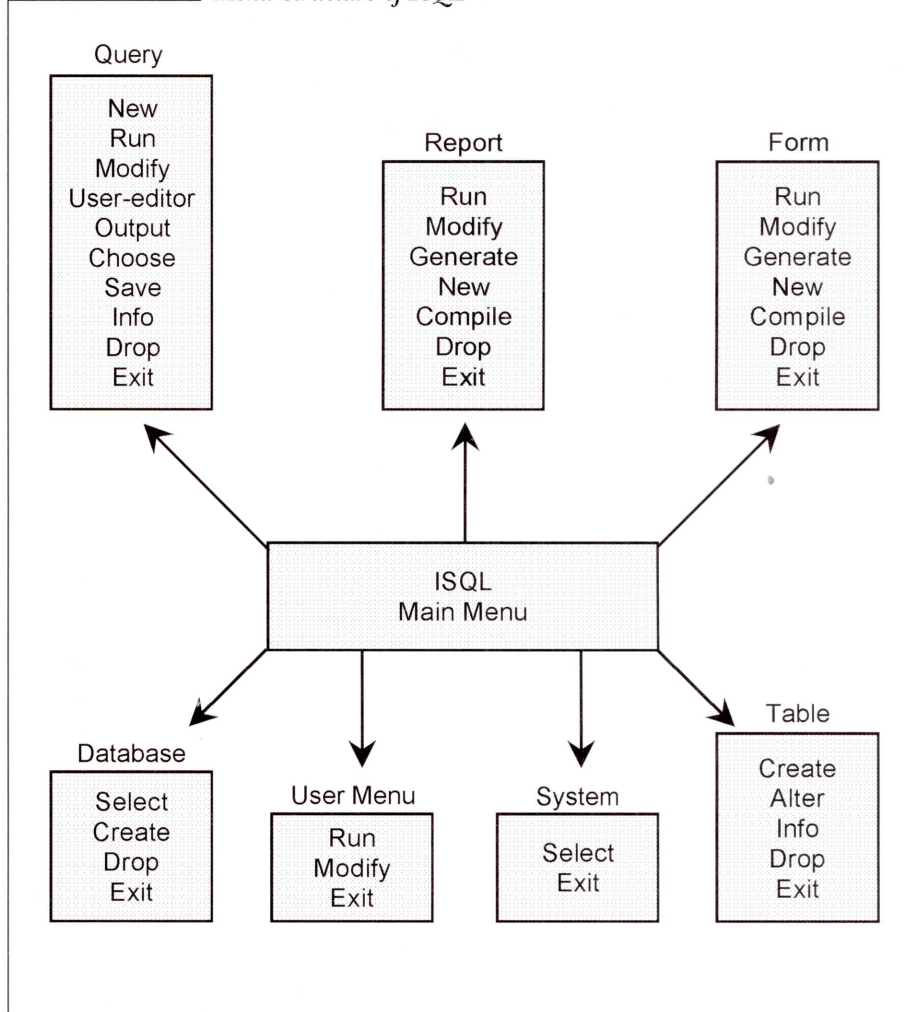
### AIMS JukeboxManager

JukeboxManager is an extension of AIMS MediaManager and provides support for single and multiple optical jukebox units. It can even reference platters stored outside the jukebox(es).

Optical jukeboxes rely on robotic systems that allow a large number of optical platters stored in slots to appear online to the computer system. An elevator unit fetches platters from storage and inserts them into the optical disk drive's slot. The jukebox is controlled independently of the disk drive, and one jukebox can support several drives.

Typically, jukeboxes support 30 to 200 platters of 600 to 900 MB, contain 2 to 10 drives per jukebox, and complete platter exchanges within 5 to 25 seconds. HP's jukeboxes are available in 20-, 60- and 100-GB models and can be combined to access up to 280 GB of data. Platters may be moved freely in and out of the jukebox "mail slot" by the system administrator. Platters removed from a jukebox slot are classified as "on the shelf," but are still defined in the system.

**FIGURE 4** Menu Structure of ISQL



JukeboxManager consists of three modules: the DIMMR (previously described), JukeboxManager Process, and JukeboxManager Utility (JMU). The JukeboxManager Process controls the elevator unit via an RS-232C serial port. SCSI connection is also supported, with each jukebox requiring one SCSI address for the elevator unit and one for each drive in the jukebox.

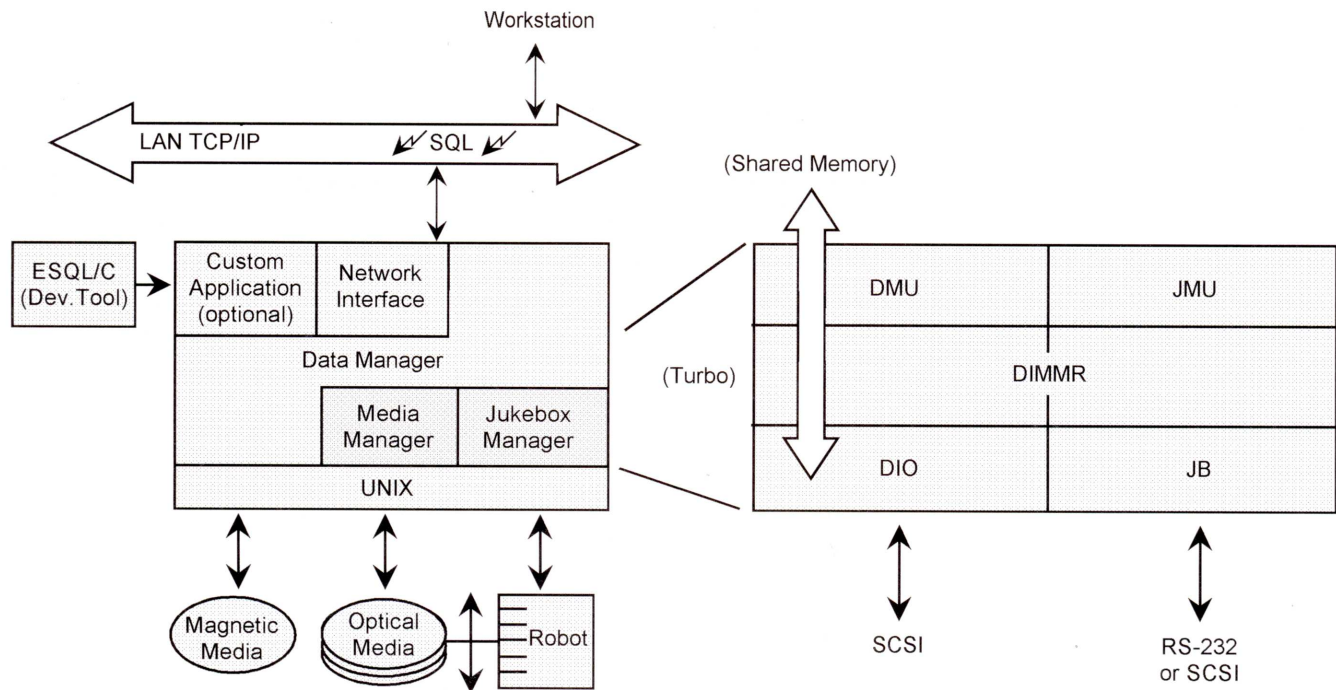
The JMU is a tool for configuring and operating jukeboxes and drives. It is an extended version of the DMU utility in

MediaManager, offering an expanded command set. The user interface is the same as for MediaManager. The jukebox extension allows the Systems Administrator to define jukeboxes, insert and remove platters, and keep track of the inventory of platters belonging to the system.

Jukebox utility commands permit the following operations to be performed:

- define/drop jukeboxes in the system (same as DMU)



**FIGURE 5** *MediaManager and JukeboxManager*

- automatically move a platter from one slot to another
- physically insert a platter in the jukebox, either blank or used (from the shelf)
- physically remove cartridges from the jukebox onto the shelf
- list all platters known to the system (i.e., all platters ever used)
- list all cartridges currently inserted in a jukebox

Figure 5 shows MediaManager and JukeboxManager and their interrelationship to various other system components and utilities.

## Conclusion

Hewlett-Packard's AIMS is among the most advanced imaging systems

available. This is due in large part to its comprehensive development environment, which consists of the AIMS Applications Designer and a number of Standard Runtime libraries, the Microsoft Windows Development Kit and C compiler. The AIMS Standard Development Library pack includes both the AIMS Application Designer and Standard Runtime libraries. In addition, there is full support for DDE Libraries and AIMS FAX Development Library software.

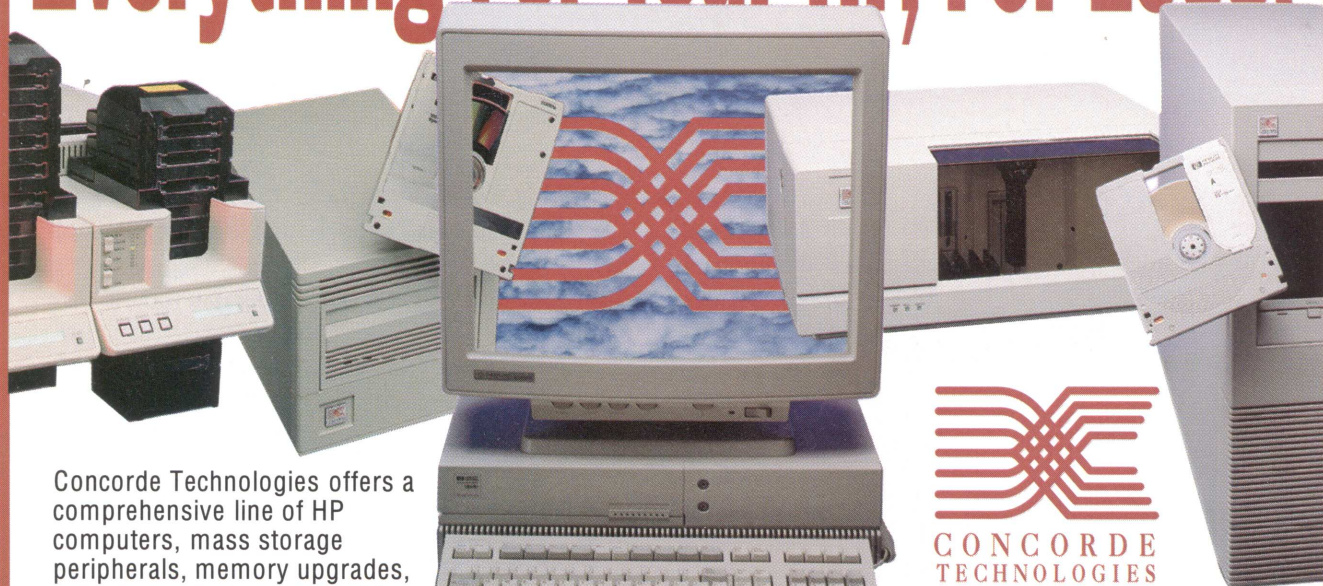
This advanced development environment facilitates the design and delivery of custom business solutions based on AIMS. On an international basis, Hewlett-Packard works with a number of systems integrators—"Image Partners"—who use these tools to build custom

imaging systems and integrate applications across multiple platforms. ■

*Nathan Muller is an independent consultant in Huntsville, Alabama, specializing in advanced technology marketing and education. In more than 20 years of industry experience, he has written extensively on many aspects of computers and communications, having published six books and hundreds of technical articles. He has held numerous technical and marketing positions with such companies as Control Data Corporation, Planning Research Corporation, Cable & Wireless Communications, ITT Telecom, and General DataComm Inc.*



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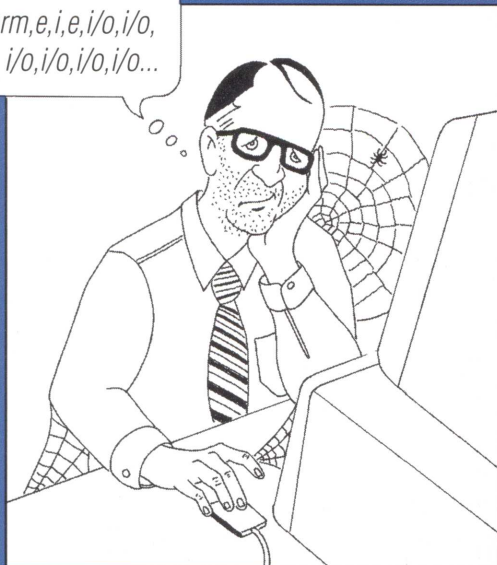
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by David L. Totsch

## The Kernel Courtesy Loader

HAVE YOU EVER WONDERED what the “#!” notation in the first line of a shell script really does for you? Yes, it specifies the shell to be used to interpret the script, but it really does more than that.

In fact, it does something quite interesting. So interesting that you will want to take advantage of it.

To take advantage of the “#!” notation, you have to know what is looking for it and why. The what is the kernel itself. The why, aside from being historically linked to the appearance of multiple shells, is so that interpreted shell scripts can become executable programs. What the kernel does is scan the interpreter name following the “#!”—usually something like “/bin/sh.” If anything follows, it is scanned in as an argument (white space and all). This interpreter is then execed with the argument scanned as the first argument, the name of the file this script is in as the second argument, and the arguments with which the script was executed filling out the argument list. Here is an example detailing what the sentences above actually say:

```
$ cat example
#!/bin/sh -efu
echo "PARAMETER0 = >$0<"
echo "PARAMETER1 = >$1<"
echo "PARAMETER2 = >$2<"
echo "PARAMETER3 = >$3<"
echo "PARAMETER4 = >$4<"
echo "ARG COUNT  = > $#<"
echo "FLAGS      = >$-<"
echo "THE WHOLE THING = >$*<"
$ ls -l ./example
-rwx----- 1 work users 220 May 9 20:03 ./example
$ ./example parm1 parm2 parm3 parm4 parm5
PARAMETER0 = >./example<
PARAMETER1 = >parm1<
PARAMETER2 = >parm2<
PARAMETER3 = >parm3<
PARAMETER4 = >parm4<
ARG COUNT  = >5<
FLAGS      = >efu<
THE WHOLE THING = >parm1 parm2 parm3 parm4 parm5<
$ exit
```

Keep in mind that the executable file itself is getting read into the interpreter by a call similar to “sh -f ./example.” Also, note that the argument read from the file passes all white space. For example, if I change the notation from “#!/bin/sh” to “#!/bin/sh -f parmx”:

```
$ cat example
#!/bin/sh -f parmx
```



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INTEREX

```
echo "PARAMETER0 = >$0<"
echo "PARAMETER1 = >$1<"
echo "PARAMETER2 = >$2<"
echo "PARAMETER3 = >$3<"
echo "PARAMETER4 = >$4<"
echo "ARG COUNT = >$#<"
echo "FLAGS      = >$-<"
echo "THE WHOLE THING = >$*<"
$ ./example
-f parmx: bad option(s)
$ exit
```

This is the same as if I had typed the command

```
sh "-f parmx"
```

"-f parmx" all gets sent as one parameter. This also brings us to the realization that there is no helpful shell parsing and interpreting our arguments for us. This can be made clearer by another example:

```
##### I want to print the first column of ps output
#####
$ cat awk_A
#!/usr/bin/awk { print $1 }
$ ps | ./awk_A
#!
##### Now wait just one minute, that isn't what I expected!
##### The script was right but the input was the script file.
##### Let's try another way....
$ cat awk_B
#!/usr/bin/awk
{ print $1 }
$ ps | ./awk_B
awk_B: syntax error at source line 1
context is
    >>> . <<< /awk_B
awk_B: bailing out at source line 1
##### Well, awk expects its first arg to be the script, and
##### that is just what it did. Note that the arg passed was
##### indeed the name of the script file.
#####
##### One more try....
$ cat awk_C
#!/usr/bin/awk -f
{ print $1 }
```



```
$ ps | ./awk_C
PID
10606
10616
10617
##### Just what we wanted.
$ exit
```

If you want the script to work on itself as in the first example above, you need to remember that there is a limitation. The kernel will read only the first 32 characters following the “#!”

There are two other limitations you should concern yourself with if you are planning on taking advantage of the courtesy loader. First, the command name the kernel reads in should be the full path name to the command. \$PATH will not be available for the kernel to search. Second, the interpreter you use should understand that first line of the script as a command or somehow ignore it. Both sed(1) and awk(1) follow the convention of “#” preceding comments. Commands like grep(1), echo(1), cat(1), and pg(1) can perform interesting functions through this convention. You can even create a self-removing script with rm(1)!

Now, aside from experimenting and playing with the courtesy loader (yes, some of us who do not wear sandals and T-shirts to work actually have fun with UNIX), there is a useful function to be noted:

```
$ cat test.data
one      1
two      2
three    3
four     4
five     5
six      6
seven    7
eight    8
nine     9
zero     0
$ cat awk.sh
#!/bin/sh
awk '{ print $1 }' $*
$ time ./awk.sh test.data
one
two
three
```

```
four
five
six
seven
eight
nine

zero
real 0m0.06s
user 0m0.02s
sys  0m0.04s
$ cat awk2.sh
#!/usr/bin/awk -f
{ print $1 }
$ time ./awk2.sh test.data
one
two
three
four
five
six
seven
eight
nine

zero
real 0m0.03s
user 0m0.02s
sys  0m0.01s
$ exit
```

What does the above mean? The next time you need to write a shell, save some system resource by using the courtesy loader. If you do not need a shell for your script, do not use one. This is particularly useful on systems that are short on resources, for writing compact awk(1) or sed(1) command scripts, and for conserving system resources on a script that might be called multiple times in a loop. ■

---

*David L. Totsch is lead technical specialist at LaSalle National Bank, Treasury Systems, Chicago, Illinois. He has more than six years' experience with various flavors of UNIX. Totsch serves on the Board of Directors for UniForum Chicago. He is also on the steering committee for the Chicago Regional Users Group of HP computers (CRUG).*



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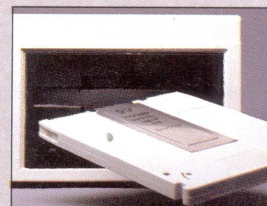
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# HP-UX Systems Administration

by Chris Curtin

## HP-UX 9.0

HP-UX 9.0 HAS BEEN SHIPPING for approximately seven months now and if you are like me, you have been too busy to update. The new features of HP-UX 9.0 are certainly enough for us to want to update, but the down time required is often too much.

### *HP-UX 9.0 New Features (or "Do I really need to upgrade?")*

The decision whether to upgrade may or may not be very clear-cut. Many sites are happy with their systems and applications and may not feel the need to update. Things to consider when making the decision to upgrade now, instead of waiting:

1. Are there any new features in HP-UX 9.0 that I really need now?
2. Can I afford to take my system(s) off line for a day (or more)?
3. Are all my applications going to work???

All of the information about HP-UX 9.0 is in the manual *Release Notes for HP-UX 9.0*. Remember when the release notes were a couple of printed pages! This manual contains all the information that you need to answer these questions.

In answer to number 1: HP-UX 9.0 adds several new features that make the System Administrator's life easier. While the new SAM takes some getting used to, it presents a nice interface for performing your administration tasks. NFS is now based upon 4.1 from Sun Microsystems and allows exporting a file system with root access. No more 'adb'ing the kernel!

For Series 800 customers, Logical Volume Manager (LVM) allows you to make file systems of virtually unlimited size and add and delete space from these

file systems as needed. It also allows you to specify exactly how much space you want for swap and your file systems.

No more 20-MB file systems that you cannot use because of your disk partitions!

HP VUE 3.0 and VUE Lite are HP's new graphical user interfaces. VUE 3.0 adds drag and drop capabilities, a better integrated workspace manager and lower overhead. VUE Lite is an implementation of VUE that does not have all the bells and whistles and greatly reduces the number of processes and the memory necessary per user.

HP-UX 9.0 has Motif 1.2 and the X Window System Release 5, the latest releases for X Window users. Motif 1.2 adds drag and drop capabilities and a more robust interface.

I have installed HP-UX 9.0 three times and updated twice. The updates required less work once 9.0 was installed. Not including the backups, an updating or installing on fast 700 and 800 boxes (a 715, G30, and 827) took about two hours. Most of the time was spent waiting for the system to be loaded from tape.

Now for the really fun one: applications. As a software engineer, I was not looking forward to HP-UX 9.0. While it has some great new tools, updating existing applications was a pain. In HP-UX 9.0 the FORTRAN compiler changed, the C++ compiler changed, the Motif and X Window System release changed, several low-level HP-UX functions changed functionality or were obsoleted, and the Korn Shell changed.

With all of these changes, make sure that your software suppliers have been testing their applications on HP-UX 9.0 and that you have the latest copies of the applications *before* you start the update. If you are an applications developer, carefully test your applications. Subtle



changes in several low-level libraries, especially in Motif and X11R5, have caused some unexpected results.

### ***Moving to HP-UX 9.0***

Now that you have made the decision to move to HP-UX 9.0, you need to make a few more decisions. First, do you update or reinstall? With 9.0 I have been recommending reinstalling. The first reason is LVM. While it is possible to migrate your root disk and other disks to LVM, the description of how to do it scares me. From an administrator's point of view, LVM makes disk space management much easier. You specify exactly how large each file system is, even if it does not match the underlying disk structure.

LVM also allows you to combine multiple disks into a single file system. This is great for large databases, but there is a downside. Nothing about LVM guarantees that a file will reside on a single physical disk. If you lose a disk, you will lose the entire file system, not just the parts that are on that disk. Backups also become an issue. I advocate backing up by file system. While it takes a little longer, data recovery is faster. If you use LVM and go overboard, how will you back up a 4-GB file system? Compressed DAT tapes only give you 2 to 2.5 GB. Think about how long it will take to restore a single file from that file system!

The second reason to install is that you are installing to a machine that probably was shipped with HP-UX 8.0 installed on it by the factory. (I say probably because of the fantastic growth HP has had since HP-UX 8.0 was introduced.) As installed by HP, your system probably has 100 MB of "demo" files that you do not need or use. Installing allows you to pick the file sets that you want on

your system, thus freeing up some valuable disk space. Installing 9.0 on a new box is also a good idea for the same reasons. Don't worry about not loading a needed file set. If a necessary file set is not selected, the update/install program will tell you. You can also go back later and load any file sets that you missed.

Finally, installing allows you to rearrange your disks to meet the changing needs of your users. If you selectively restore directories, you will be amazed how directories that are "critical" to a user are not missed.

Whether you choose to install or update, the most important action to do first is make sure that you have everything you need. Once you start, it is very difficult to stop.

With HP-UX 9.0, HP began shipping a list of the products included in the shipment. In the past you had to run `/etc/update` on the tapes and write down the file sets on the tapes. Carefully review these documents and verify that all products you have support for are on a tape.

If you have multiple tapes, write down the part numbers and call HP to find out which are the latest and greatest. I had problems on two systems because of incompatible releases of file sets. Series 700 users should be especially careful. Label the tapes that you are going to use and mark the others as "old" or remove the labels and reuse them.

Next read, read, read. Locate the *Release Notes for HP-UX 9.0*, *Installing and Updating HP-UX 9.0*, and all the "Read Me Before Installing..." manuals. Read each one carefully. There are some special instructions for different hardware and software combinations.

Now that you are ready to start, do two backups. The first is a complete backup,

including all the HP-UX 8.0 files. This is your safety net. Do this backup by file system. If you need to restore something from this backup, it will be quicker if the tapes are by file system.

Next back up all the information that you want to move to the next release. *Installing and Updating HP-UX 9.0* has a list of the files recommended for backup. I would add:

```
/etc/smtp.hosts
/usr/lib/uucp/Systems
/usr/lib/uucp/Devices
/usr/lib/uucp/Contacts
/usr/lib/sendmail.cf
```

If you are updating, you should copy these files to another disk that will not get overwritten by the update.

If you are installing, also back up all the non-HP-UX release specific information. This includes `/users`, all custom applications, and all configuration files for the standard HP applications.

In my column "Installing and Updating HP-UX 8.0" I spent a lot of time going through the installations steps. For 9.0, HP has significantly improved the documentation. I will not be covering the nuts and bolts of the installation. However, I will point out some problems I encountered and how to deal with them.

If you were one of the thousands of Series 800 users who received ARPA and NFS on a separate tape, be very careful how you install or update your system. The letter I received said that they were accidentally left off the main tape. Make a copy of the Series 800 file `/etc/conf/gen`. If you load the file sets in the wrong order, this file may get corrupted.

If you are updating, load the tape that



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has the ARPA and NFS file sets on it first. Update will complain about missing core file sets; ignore it. Next start loading the core HP-UX. This should allow your kernel to be properly built under HP-UX 9.0.

If you are going to perform an install, I would recommend getting HP to cut you a new tape. Make lots of noise if they refuse. I do not know of any way to build a kernel without those file sets.

Whether you are installing or updating, the update/install program will present you a list of what file sets you can load. Carefully check them. If you are concerned about disk space, do not load all the demos that come with it. Also do not load all the NLS languages. When was the last time you used the RUSSIAN language file set?

While the update/install program is

rebuilding kernel, it may fail. If it does, escape to a shell and check the Series 800 or dfile. If you see lots of pieces commented out, uncomment them and try to regenerate the kernel by hand. In several cases, I have seen the Series 800 and dfiles having several include lines commented out for no reason.

Once the install/update process is completed, restore any files that you need from your backups and start checking that everything still works.

I hope the information I provided here will make your update or install of HP-UX 9.0 go a little smoother. I am still looking for suggestions for topics. In the next few months I will be writing columns on installing peripherals on 700 and 800s. I'll also take a look at the new SAM and offer some more tips and tricks.

## Tip of the month

With HP-UX 9.0, the public domain program "top" is shipped and supported by HP. This is a good performance tool for seeing which processes are using the most resources. "man top" will give you more information. ■

*Chris Curtin, a software developer for Bradley Ward Systems, Inc. in Atlanta, Georgia, specializes in device driver development for factory automation on the HP 9000. He can be reached via e-mail at: [chris@bwilab3.atl.ga.us](mailto:chris@bwilab3.atl.ga.us)*



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\* The '94 Program Committee will consider proposals addressing topics that are not included in the list outlined here and encourages such submissions.

INTEREX

The International Association of Hewlett-Packard Computer Users



by Larry Headlund

## 9 TO 5

THIS IS NEITHER A belated review of the Dolly Parton/Jane Fonda movie nor a comment on the office workers' organization of the same name, but a celebration that HP-UX 9.0 includes X11R5 and Motif 1.2. Until X11R6 comes out (end of 1993?), the official HP release of X11 is the current release. This makes it much easier to use contributed widgets and programs because a lot of them depend on X11R5 features.

Of course, there is more to 9.0 than just X features. Some of these have an impact on your X life.

### *Changes to the default C compiler*

The last several releases of HP-UX have been stages of the process of unbundling the C development environment from the base OS. HP is not alone in this; most notably Sun no longer ships any C compiler with its base OS. The compiler HP includes with 9.0 is just sufficient for rebuilding the kernel. Significant differences from the compiler included with 8.x are that the O optimization flags and the g debugging flags are no longer supported. The symbolic debuggers xdb and cdb and their supporting programs are also no longer included. All the Motif and X include files and libraries are included, however. If you want to do software development on your machine you have three choices:

#### ■ Purchase the HP Developer's Kit

This includes an ANSI C compiler and the normal debugging tools. You can also purchase the SoftBench environment, which includes other tools for development and a framework for accessing other products.

#### ■ Purchase a third-party compiler

There are compilers for HP-UX available from other suppliers, often with interesting additional features.

#### ■ Get gcc

This is the compiler available from the Free Software Foundation.

### *What is the Free Software Foundation?*

The Free Software Foundation (FSF) is the brainchild of Richard Stallman (rms), creator of the EMACS editor and MacArthur Fellow. Richard Stallman is certainly an articulate individual well able to speak for himself, but if you are unfamiliar with the FSF, here is my take on its philosophy. Some of what follows involves interpretation of copyright law, so I will add the disclaimer that I am not a lawyer, nor do I play on TV!

The FSF wants to see a world where everyone has access to the source code of the programs they use. More than that, everyone will have the right to examine that code, modify it, incorporate pieces, add things to it, and pass these changes along. As part of this goal, the FSF has the GNU Project (GNU for *gnu*, not *UNIX*), an independent re-creation of all the functionality of the UNIX that is the property of AT&T. Note that the *free* in Free Software Foundation does not refer to the price of the software, but to the freedom of users and programmers.

GNU software is not public domain. The problem the FSF sees with public domain is that some third party could include public domain software in its own proprietary products and not make these new sources available. Instead, GNU software is covered by the General Public License, often referred to as the copyleft.

The copyleft is an original creation




of rms and its originality has led to a great deal of confusion and uncertainty about its use. Basically, the GPL (a full copy of which is enclosed with all GNU software) says that if you use GPL'ed software in your own product and then distribute that product, you must make the complete source code for your own product available under the GPL. This has caused GPL'ed software to be described as containing a benign virus.

The copyleft is not only a model for what I will call public software. For example, X is distributed under a license that allows modifications to be kept proprietary. It requires only that a copyright notice be maintained. Postgres, an extended relational database management system from UC Berkeley, requires that commercial modifications be made available to the originators. Opinions as to what the best model is form the basis for one of the top 10 religious discussions on the net, exceeded in volume only by the debate on whether emacs or vi is the better editor.

Richard Stallman hence has the distinction of being the ultimate source of two of the most popular debates on the net.

What are the terms of the GPL? Source must be made available for a nominal charge to cover distribution costs, and whoever receives it is free to redistribute it on the same terms. What this implies is that there cannot be licensing fees for software, since everyone has free and equal access to the source code and the same rights to redistribute. The theory is that GPL'ed software will prove so useful, because everyone will be able to improve it and make it superior to software produced by "software hoarders," that eventually all software will be GPL'ed.



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## CIRCLE 48 ON READER SERVICE CARD

This virus nature of the GPL has scared many legitimate users away from GNU software. There was a feeling that compiling code with gcc, the GNU compiler, somehow infected the code and put it under the GPL. I think this is a mistake; the GPL is all about the distribution of software. What you do on your own machine is your own. One could as well argue that using Microsoft Word gives Microsoft some claim on your prose. Distributing executable compiled with gcc is another matter, but typically is also allowed. See the licensing documentation included with the gcc distribution.

I should add that during a recent discussion on gnu.misc.discuss, Richard Stallman said "Don't believe what anyone else tells you about the GPL." With that caveat, I don't think there is any reason for anyone totally to avoid GNU software.

### *What is gcc?*

The gcc compiler in the 2.x releases includes, in a single executable, an ANSI C compiler, a C++ compiler, and an Objective-C compiler. Even if you already have these compilers from other sources, I think it's a good idea also to have the gcc package in your tool box. One reason is that gcc is a standard for available software. I don't know how many times I've seen a README with the phrase "compiles under gcc on..." The X distribution from MIT even has a HAS\_GCC flag! If you intend to make your source available, it is almost expected that your code will compile with gcc. Having a second compiler as a benchmark is particularly useful when you have a nagging suspicion that you are exercising a compiler bug. Just recompile with the other compiler and see if the problem persists.

*Continued*



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If you are aiming for portability, there is nothing like a second compiler to find hidden assumptions.

There are some limitations to gcc under HP-UX. The most serious is that if you combine gcc with HP's assembler, there is no symbolic debugger available. If you compile with gas, the GNU assembler, the GNU debugger can be used, but you won't be able to link with all libraries produced with the HP assembler. The reason there is no debugging support is that the structure of HP's object files is not publicly available. The reasons for this were discussed recently on the net and to my mind HP had good reasons for its policy. The upshot is that if you absolutely need debugging support and object code compatibility, gcc cannot be your primary compiler.

#### **Where do you get gcc?**

Just about every ftp site will have a copy of gcc. A version is on the Interex Contributed Software Library tape. An HP-specific version with executables is also available from the Interworks ftp site [iworks.ecn.uiowa.edu](http://iworks.ecn.uiowa.edu) and on their CD-ROM. Versions of gcc prior to 2.x will have the C++ compiler separately under g++.

When I compiled gcc under HP-UX 9.0 on a 900/425, I had to make some modifications to the Makefile after running configure. I explicitly set `ALLOCA=alloca.o` and `RANLIB=touch`. When running the final testing of gcc, my script always hung during compare while doing a tail. I have experienced no problems with the compiler itself.

gcc is configured, and has been tested, on almost every UNIX architecture and also VMS, MS-DOS, etc. It is the primary compiler delivered with NextStep from Next.

```
CFLAGS = -I/usr/include/X11R5
optional_libs = -L/usr/lib/X11R5 -lXt -lX11 -lcurses -lm -lc -lpw
ALL_CFLAGS = $(CFLAGS) -DHAVE_STRSTR=1 \
-DSTDC_HEADERS=1 -DHAVE_UNISTD_H=1 \
-DDIRENT=1 -DHAVE_SYS_TIME_H=1 -DHAVE_S-DHAVE_X11R4=1 \
-DRETSIGTYPE=intTRING_H=1 \
-DHAVE_MEMORY_H=1 -DHAVE_X11_X_H=1 -DRETSIGTYPE=int
```

#### **An X spreadsheet**

Now that you have gcc (or even if you don't), you should look at another GNU product: oleo. Oleo is a spreadsheet with both curses for character terminals and X support. One of the most frequently requested pieces of software is a publicly available spreadsheet for X and oleo is a contender. However, don't expect a Wingz from Informix or Asterix from Applix. Oleo does work under X and supports X inputs but it is a character-based application with X support. That is, it does not have a full GUI interface with pull down menus, pop-up dialogues, etc. In this respect it most resembles the first release of Lotus 1-2-3 for Motif. It does not use the Motif or Athena widget sets, instead making direct calls to Xt and Xlib.

The version I made (oleo-1.2.2 from the Interworks CD-ROM) required some hacking in the configure and Makefile to support X. When configure was run out of the box, it did not recognize the presence of X on my system. I had to force it explicitly to recognize X in the Makefile.

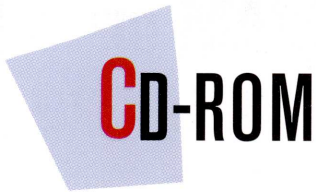
In detail, the appropriate lines in the Makefile are shown in the box above.

With these changes oleo works fine. If you just need a basic spreadsheet under X, this is certainly a place to look. ■

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*Larry Headlund is president of Eikonal Systems, a software development company specializing in the optical industry, and a consultant on UNIX and X. He has been working with commercial UNIX since 1982 and with HP-UX since 1984. He can be reached at [lmh@world.std.com](mailto:lmh@world.std.com) or 1-617-482-3345.*





by Bill Hassell

## Standards, Standards

**QUESTION:** WHERE DO I get copies of the Red book?

**ANSWER:** The Red Book? Isn't that a magazine? Actually, the Red Book is the term given to the audio specification document first defined by Sony and Philips many years ago. The Yellow Book is the specification for CD-ROMs, more generally known as ISO 9660.

**Audio Red Book CEI IEC 908**

**CD-ROM Yellow Book ISO 10149:1989**

They are both available from:

ANSI

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**QUESTION:** Where can I get the latest ECMA 168 standard?

**ANSWER:** The CD-ROM standard ISO/IEC DIS 13490 (also known as ECMA 168) is now available via ftp from the Internet. The machine's name is cdrom.com, login is ftp (pw: ftp), and the location of the file is

/cdrom/ecma168.

You will need an open subnet computer to get to this location.

The file is in Postscript only!

*The file prints correctly on A4 paper only!* (Note the emphasis.) A4 is slightly larger than 8.5 by 11 so there will be loss of the page numbers at the top of the document! Print on legal paper (if you

don't have A4) to ensure 100 percent of the text. (Size A4 is a European standard, which is appropriate since ECMA is the European Computer Manufacturer's Association.)

### Data Compression on CD-ROMs

CD ROM, Inc. recently announced the release of a compression driver that permits the user of Stacker, Double Space, Super Store, and other compression packages to manufacture a compressed CD-ROM and then access the compressed disc. This effectively doubles the capacity of the standard CD-ROM disc from 660 MB to 1.3 GB, giving the new disc a capacity of 600,000 pages of text.

Dr. Roger Hutchison, president of CD ROM, Inc. says of the development, "CD ROM, Inc. has been working in the compression world for just over 36 months. We have achieved lossless compression rates in the range of 8:1, and lossy compression rates in the range of 140:1. This driver represents a first in the CD-ROM industry in which the users of standard off-the-shelf compression packages can double their volume size on the CD-ROM disc itself."

Features of the CRI-X2 Driver include:

- no performance deterioration
- very small additional memory requirements
- compressed and uncompressed discs can be interchanged during applications
- double or more capacity from 660 MB to 1.32 GB

Licensing and pricing information is available at:

CD ROM, Inc.  
ATTN: CRI-X2 office

### CORRECTION

In the article entitled "Hp LaserROM Takes on a New Look" in the March 1993 issue there are two errors in command line listings.

On page 23, half way down column 1 is the line:

```
make -f con g.mk
```

This should be:

```
make -f config.mk
```

The same correction needs to be made on page 25, about two thirds of the way down column 1.



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### No Caddies?

It's always been a question in CD-ROM circles: how come CD-ROMs need caddies and audio CDs don't? Most of the answers relate to handling, but usually, CD-ROMs used in business and research are left spinning for weeks or months. Several manufacturers have started designs for caddyless drives, including Magnavox, NEC, and Laser Magnetic Storage (LMSI). LMSI's new drive is a double speed (almost a standard feature for new CD-ROM drives these days). The caddyless design seems to provide better dust protection than the flip-doors of current designs.

The LMSI internal drive for PCs will retail at about \$499 and comes PhotoCD-compatible and with a caddyless drawer. LMSI is part of North American Philips company and is at (719) 593-7900.

### No Slot External CD-ROM Drive

Micro Solutions is shipping a parallel port CD-ROM drive that is ideal for sharing a CD-ROM drive or for use as a portable drive. It simply plugs into a standard PC printer port (most all PC ports are bidirectional) and with the supplied drivers, it appears like any other CD-ROM drive to DOS. Compatible with DOS 3.1 and higher, it weighs 5 pounds and has audio line outputs as well as a jack for headphones. This is also ideal for PCs with no free I/O slots to add an interface card. The Micro Solutions drive is about \$499 and they can be reached at (815) 756-3411.

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### LaserROM/PC Works on DOS 6

LaserROM/PC has been tested in the DOS 6.0 environment (using Windows 3.1) and the results were just fine. Note that DOS 6.0 is now shipping MSCDEX, which no longer needs the SETVER utility. Be sure to use the MSCDEX file from DOS 6.0 rather than from previous versions of LaserROM installations.

### PhotoCD Programming Tools

PhotoCD Access software allows DOS users to read and save PhotoCD images as DOS files which can be subsequently used in other programs. The CD Access developer's toolkit provides a library of C-language programming functions to read PhotoCD images and manipulate them directly in memory. The toolkit also provides sample routines that can export the images to formats like TIFF and EPS. The PhotoCD Access software is \$39.95; the toolkit is \$695. For more information from Kodak: (800) 242-2424, ext. 53.

### Help! My Disc Won't Stay In!

We receive a couple of calls a month from people who report the CD-ROM is broken because it won't keep the CD inside the unit. This isn't weird behavior—it is perfectly normal if the disc is not readable. Just place the CD into the carrier with the painted side down and load it into the drive. Bingo! Out it pops. Now the older A1999A drives (the Toshiba 3201 series without a flip-door) do not eject the disc; rather, they just leave the orange LED on steady.

For the HP-IB drives, the yellow fault light will turn on when the disc is inserted upside down. ■

*Bill Hassell is an HP-UX system support engineer at the HP Atlanta Response Center. He can be contacted at his e-mail address, which is blh@hpuerca.atl.hp.com.*





## CSL/HP-UX

ISN'T TECHNOLOGY WONDERFUL? If you hung around our office, you might hear this phrase several times a day. Most of us use it sarcastically, especially when we are having a difficult time solving a sticky problem. We seem to be cursing the very substance of our livelihood. If it weren't for the technology, we would be off pursuing other challenges like mountain climbing or visiting English castles.

It is amazing to realize how far we've come in such a short time. In my lifetime, we have sent men to the moon and begun to live in space for extended periods of time. We can instantly communicate anywhere in the world.

As much fun as it is to look back on where we've come from, it is equally fascinating to consider the possibilities for the future. A commercial that is airing on television these days shows some interesting possibilities. Faxing a note to a colleague while lounging on a tropical beach, reading a rare manuscript while half a world away, and—my personal favorite—having my wife's entire medical history and pregnancy record (complete with a video of the last ultrasound) stored on credit-card-sized media, ready for the day we head for the hospital.

Change is a constant in the age of computing. Not a day goes by without some new capability being announced, a faster processor coming to market, or some new management buzzword taking over the pages of the computing press. At times, the speed of these changes is harder to deal with than knowing how you might absorb the new capabilities. But if we are committed to changing our environments, we need to understand the non-technical motivators around us and then take our best shot at applying our skill and knowledge.

Since joining Interex over 10 years ago, I have watched as both the individual users as well as the organization changed with the times. We have struggled through several product transitions like the HP/1000 A-series and the Spectrum introductions. We have seen several incarnations of HP-UX and MPE and endured the rhetoric of the "Open Systems" hype. Most of these battles have not been technical in nature, but more emotional and psychological. Change can be difficult, especially when that change appears to challenge the status quo.

HP and Interex are to be commended for being willing to confront these issues head on. It has been tough, but with the diligence of many volunteers and the board and staff all working together, these problems have been overcome and we continue to move forward. The organization itself has had to adjust to a user base that is growing into other areas. Now, with a new strategic plan in place, I am confident that the organization is ready for the new challenges that lie ahead.

The Contributed Software Library (CSL) is undergoing some rather substantial changes as well. Not only is the HP-UX market growing, the number of new users is too. Their skills and experiences are wide and varied; they might be chemists or marketing professionals, engineers or secretaries. Even some former mainframe programmers are taking up the challenge. As users, they need a CSL that is more responsive to their needs and can be delivered in a way that enhances the rapidly changing computing environment they deal with every day. Issues like system administration, programming, and networking are clearly in the forefront. As



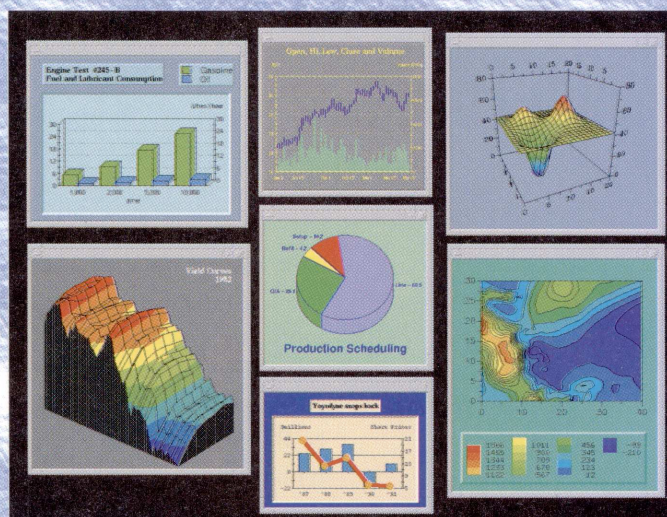
the chairman of the CSL and a member of the coordinating committee, I have taken several initial steps in enabling to fulfill the needs of the users. Some of these steps include online access to contributions, keyword index and search capabilities, and enhanced offerings such as online documents and interactive support.

Change, like death and taxes, is inevitable. How well we deal with change speaks volumes about who we are. Come along with us as the HP-UX community moves forward; you won't believe what might happen!

P.S. Come visit the CSL booth at the San Francisco Conference and say hello. Members of the committees will be around to answer questions and listen to your comments. I hope to see you there!



Paul Gerwitz is chairman of the CSL/HP-UX committee and is a system analyst at Eastman Kodak Company in Rochester, New York. He can be reached at 716-477-3067 or by e-mail at [gerwitz@interex.org](mailto:gerwitz@interex.org) or [gerwitz@kodak.com](mailto:gerwitz@kodak.com)



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- Logging subsystems status display, and logfile analysis.
- Network-related status display and configuration weaknesses.

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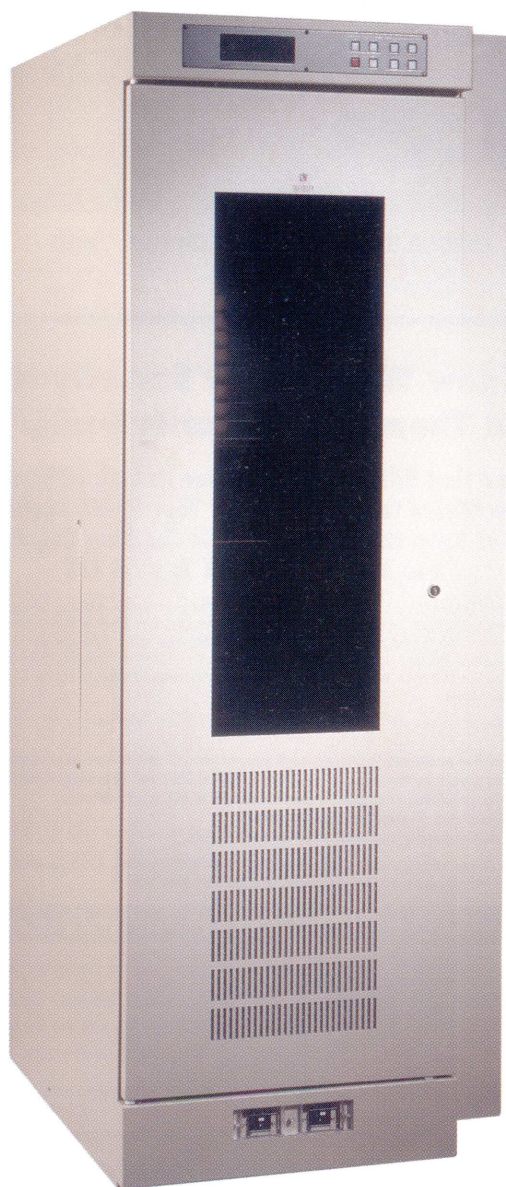
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## Mass Storage System



THE CONCEPT OF DOWNSIZING is changing the high-end computing market with more than just mainframe replacements. Consider the Infinity File System, the recently announced mass storage system by R Squared. Touted as a viable alternative to the larger (space-wise) silo systems, the IFS2 is reportedly the only block-based virtual file system conforming to the IEEE industry standard mass

storage reference model compatible with UNIX and Windows NT.

The IFS2, R Squared's software driver, which works with a network-mount VHS robotic tape system, is also different from other mass storage devices in its format. "We don't see a lot of VHS in the marketplace," observed Steve Wine, general manager of R Squared's Mass Storage Division.

Unlike DAT or 8-mm tape, he explained, the VHS systems tend to be restricted to the high end of the marketplace. In addition, "there's not software capable of driving this drive." But R Squared has found that its

Infinity software driver supports VHS, chosen by the company because it was viewed as "a tape technology that was reliable, robust."

R Squared went with VHS for flexibility, capacity, and cost. The product is designed to allow linear search or block mode in forward and reverse, as well as tape ejection without rewinding. To Wine's knowledge, technology has not, to date, supported this on VHS. In fact, he stated, "I have been in this industry since 1983, and this is just revolutionary."

IFS2 features client-server-based Hierarchical Block Migration (HBM). HBM is designed to completely automate the process of migrating files when the disk fills up. Files that are not accessed often are migrated to backup storage devices where they remain until accessed again. IFS2 also offers the ability to choose which files to migrate exclusive of the automatic function, depending on the needs of the end user.

R Squared's block mode system is also designed for quick access of archived data, because only select portions are actually called into the Winchester drive. With this capability, Wine suggested, "a user can read or write to a relational database directly atop the IFS2 file structure."

Wine attributed the product's large capacity to robotic handling and the VHS format. The IFS 700T, a 48-cartridge system, can render 896 GB of storage, and the IFS 9000T, a 600-cartridge system, provides 10.8 terabytes of storage. Such levels of capacity are typically matched only by large silo systems, he said, adding that the IFS 9000T cartridge system consumes less than 18 square feet: "It's the size of a large file cabinet." Wine said 10 StorageTek silo



systems would be necessary for comparable storage capacity, but that one silo requires approximately 200 square feet. Because of the combined capacity and flexibility, said Wine, users now "can have a limitless amount of online disk space (and) can migrate data to a file server that has these large libraries connected to it."

Another advantage to the IFS2 is cost: "Companies can't always afford to purchase more hard disk," Wine observed. "If you're looking at (VHS) tape, you're only looking at \$25 (for storage medium)."

An IFS client license costs \$650 per workstation, and the IFS2 server, including software and jukeboxes, runs \$265,000 for the 896 GB model, up to \$775,000 for the 10.8 terabyte version. Within the next three months, the capacity of each cartridge will grow to over 20 GB. This means 960 GB and 12 terabytes for the above-quoted systems, respectively.

The IFS2 is designed to offer compatibility with both optical disk and tape library systems connected to the same server. The file system offers standards compatibility and is system-independent. IFS2 supports HP's entire line of optical disk jukeboxes, which ranges from 10 to 100 GB. In addition, R Squared was recently designated an HP OEM partner for HP optical libraries.

The IFS2, IFS 700T, and IFS 9000T will be available on HP 9000 systems in the fourth quarter of 1993. Contact R Squared's Doug Herrington or Steve Wine, 11211 East Arapahoe Road, Englewood, Colorado 80112, ph: (303) 784-7030 or (800) 934-7030, fx: (303) 799-9297, e-mail: user@r2.com.

*Continued*

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## Workstation Management

SYSTEMS MANAGEMENT HAS ALWAYS been an issue for sites with UNIX business systems, and Alan Paller, Director of Open Systems at Computer Associates, believes it is a particularly pressing one for HP-UX users: "HP-UX is a version of UNIX for implementing business applications. And the HP-UX user in a business environment is putting data on his workstation that he would never put on other workstations."

As such, Computer Associates (CA) has announced it will make CA-UNICENTER/125, an integrated systems management package for UNIX-based workstations, available on HP's Apollo 9000 Series 700 workstations. Because of HP's emphasis on commercial use of its HP-UX systems, HP's workstation family is the first for which CA is making its CA-UNICENTER/125 product available. It is intended to complement CA-UNICENTER/325, which already runs on the HP-UX-based HP 9000 Series 800 business servers.

Paller explained how the two products work together: "The 325 provides a whole set of management functions for servers and a small amount of client functions. But every single buyer of 325 wanted three things: security, file management, and scheduling. And they didn't want to put a 325 on each workstation."

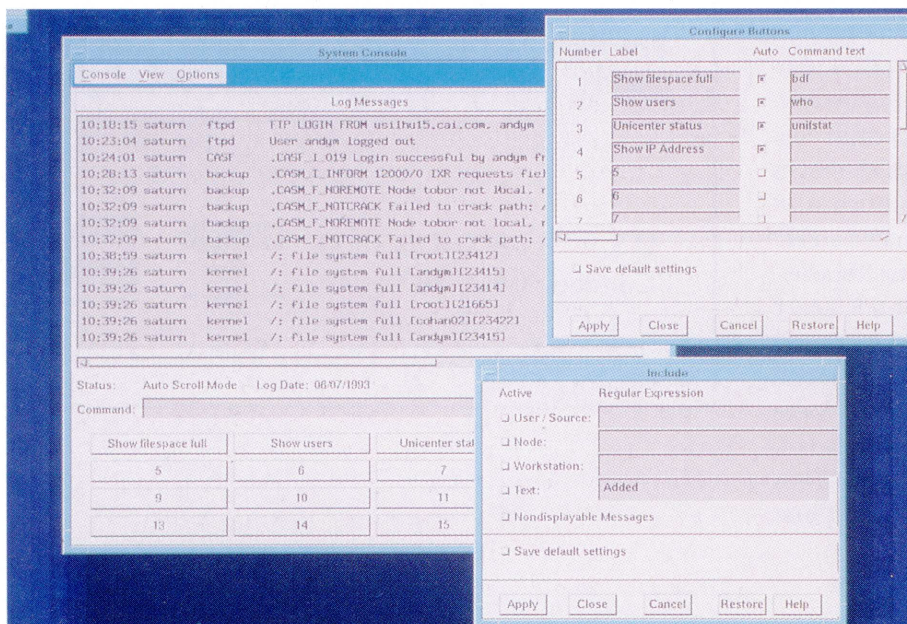
Enter CA-UNICENTER/125, which essentially provides workstation management, with individual policies and databases stored on the workstation. To take advantage of the 125's workstation-level functionality, one must already have CA-UNICENTER 325, for mainframes and mid-range servers, somewhere in the network.

CA-UNICENTER/125 provides workstation users with a graphical user interface and the ability to back up, archive, and retrieve files stored on many types of devices located anywhere in the network. In addition, the client-server management system is designed to automatically react to information from network alerts

and system logs and to take appropriate action based on user-determined rules. By extending these capabilities to end users, the product is designed to provide users with access to their files without tying up administrators.

With both the 325 and 125 on a network, the following management functions are extended down to the workstation level:

- security management
- scheduling, workload management, and balancing





- console automation
- storage management
- help desk and problem management
- print spooling
- performance management
- resource accounting and chargeback
- report distribution

CA is working closely with HP to ensure that the product complements HP's own network management application, HP OpenView. CA-UNICENTER's security, chargeback, accounting, and problem solution features are designed to complement HP OpenView's performance tools and software distribution, so together both products can be used to show the activity inside and between networked boxes.

To illustrate how OpenView works with CA 125, Paller described their interaction in a typical network management scenario: "OpenView monitors whether or not any node (in the network) is healthy. When integrated with CA, you can monitor security across the network." For example, CA-UNICENTER 125 can locate a node where a user is trying to log on as a "superuser" without the proper permissions, and OpenView can indicate on a map where this node is in relation to others on the network.

Cooperation between HP and CA has spawned a recent agreement by which the two companies are launching a special one-year promotion to bundle CA-UNICENTER with HP 9000 Series 800 midrange and high-end business servers. The bundle includes a complete version of the CA-UNICENTER software, a 280-page book entitled *Using CA-UNICENTER*, an introductory videotape, and other documentation.

With stand-alone product purchase, users receive a tutorial booklet. Since

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CA-UNICENTER is not a shrink-wrapped product that system managers can grab off the shelf, slap onto their networked systems, and have humming along smoothly in a matter of minutes, the company offers more extensive services for a fee.

Three types of additional services are offered: the start-up pack, 10 days of personal training that the customer tailors to specific needs; classes, intended for resellers and VARs but offered to customers through purchase of training credit units (\$325 per unit, with bulk-purchase discounts available); and the service pack, extensive personalized consulting (\$1,500 per day, price caps available). For users in mainframe conversion sites that have used CA software, the company anticipates no need for additional training. However, for users with no experience with system management tools, the start-up pack is a recommended minimum. Consulting would

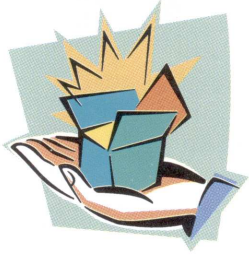
be most useful for sites that need quick implementation or are understaffed.

General, worldwide availability of CA-UNICENTER/325 is slated for late September. Pricing for the 325, based on number of users on the server or total power of the servers, ranges from \$4,000 to \$100,000. Pricing for the 125 is also user- and power-based, only the range is lower. Specifics on price and availability for CA-UNICENTER/125 will be announced later in the fall.

Contact Computer Associates International, Inc., One Computer Associates Plaza, Islandia, New York 11788-7000, ph: (516) 342-5224, fx: (516) 342-5329. ■

*Michelle Pollace is the New Products editor for hp-ux/usr.*





# New Products

## Mathematical Statistical Analysis

Visual Numerics, Inc., has announced the release of PV-WAVE Advantage, designed to provide seamless integration of IMSL's C/Math/Library and C/Stat/Library into Precision Visuals' PV-WAVE Command Language (CL) Version 4.2, which will also be available as a stand-alone product.

PV-WAVE CL, the foundation of PV-WAVE Advantage, is a fourth-generation

programming language for technical professionals in engineering, science, and business who build visual data analysis applications, letting users interactively explore, manipulate, visually analyze, and present large data sets quickly. Integrated two- and three-dimensional graphics, image and signal processing, animation, and volumetric rendering are featured.

A new PV-WAVE Advantage widget toolkit lets users customize their graphical user interface for faster application

development, run-time licensing, online documentation in Frame, and Z-buffered graphics.

The software addresses a wide range of mathematical and statistical analysis problems, including linear systems of equations, approximation and interpolation, differential equations, Eigensystem

analysis, optimization, analysis of variance, and random number generation.

PV-WAVE Advantage costs \$6,995 for a single floating license. It supports UNIX-based workstations from HP, IBM, Digital, and Sun. PV-WAVE for Windows-NT-based systems will be released later this fall.

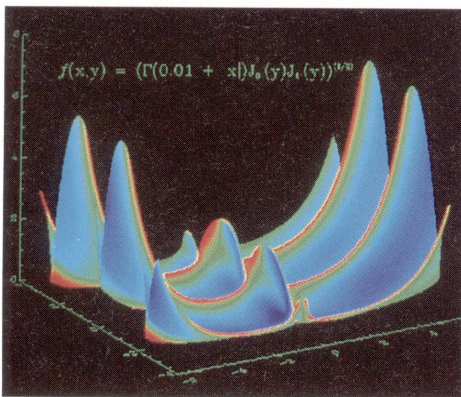
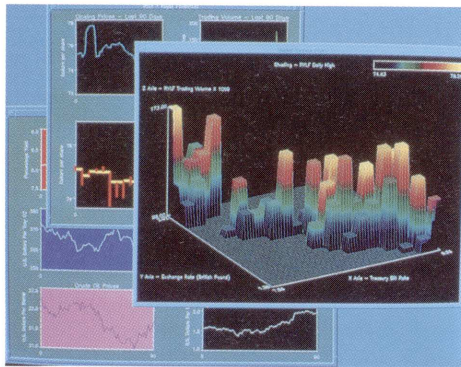
PV-WAVE:Database Connection and PV-WAVE:Maple are two new options for PV-WAVE. With PV-WAVE:Database Connection, users have an interactive, production-quality link between PV-WAVE Advantage and commercial databases, such as Oracle and Sybase. It is designed to provide seamless connections between the databases and internal PV-WAVE data structures, letting users open, query, select, subset, and import data directly from the database into PV-WAVE. This option costs \$995. PV-WAVE:Maple, based on Maple Software's Maple V for symbolic computations, lets users work with exact numbers instead of numerical approximations. Users can first symbolically derive equations using the Maple option and then graphically analyze or plot the equations using PV-WAVE Advantage. The PV-WAVE:Maple option costs \$1,995.

Contact Visual Numerics, Inc., 6230 Lookout Road, Boulder, Colorado 80301, ph: (303) 530-9000, fx: (303) 530-9329.

## Problem Management

Softool Corporation has upgraded CCC/Manager and integrated it with its new problem management product, CCC/Pro. CCC/Manager is designed to offer a complete solution for component management, application management, version merging, distributed building, and life-cycle management.

CCC/Pro is designed to manage software problems from the moment they



**Visual Numerics,  
Inc.'s PV-WAVE  
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### Tivoli Systems, Inc.'s FSM

are reported through the complete problem resolution cycle, including actual resolution of the problem. When a change request is implemented, CCC/Pro can interface with Softool's CCC/Manager product family, which manages software changes from development through maintenance.

CCC/Manager 2.1 is also designed to maintain a history of all components that were modified to resolve a particular problem, to synchronize and coordinate problem tracking with the development cycle, and to automatically validate and update the CCC/Pro database.

The product also features enhanced data administration functions, various new features now for selective access and use of information, and support for CASE interfaces. The new version of CCC/Manager now supports additional CASE interfaces such as Code Center by Centerline and Teamwork by CADRE.

Contact Laurie Mix, Softool Corporation, 340 South Kellogg Avenue, Goleta, California 93117, ph: (805) 683-5777, fx: (805) 683-4105.

### CAD Overlay

Image Systems Technology, Inc. has ported the newest version of CAD Overlay ESP to HP Apollo 9000 Series 700 workstations and to Sun SPARCstations. With Smart Raster Technology to revise scanned paper drawings, ESP Version 4.0 will support both AutoCAD Release 11 and Release 12 on UNIX with a host of new productivity tools.

CAD Overlay ESP provides functions to display raster, convert a drawing completely to AutoCAD, change or clean up the scanned image, and plot hybrid raster/vector drawings from within AutoCAD. Revisions can be saved as raster, CAD, or hybrid files. Users can

### Systems Management

Tivoli Systems, Inc. announced a new version of its systems management software, destined to facilitate managing large, dynamic networks of computers. The Tivoli Management Environment Release 1.6 incorporates new technology designed to simplify and automate the process of setting up, maintaining, and changing enterprise-wide networks of server and client computers.

Release 1.6 includes the first application to use the new services, Tivoli/FSM, which manages UNIX client-server file-sharing mechanisms—the complex series of relationships that gives users access to network data. The new services, implemented on Tivoli's object-oriented software framework for systems management, comprise three primary components of a configuration definition database, a change automation service, and a scheduling service. The configuration definition database lets system managers develop and store "templates" of key configuration information. The change automation service provides consistent changes to hundreds or thousands of workstations with a few simple steps. And the scheduling service gives system managers control over the timing of changes.

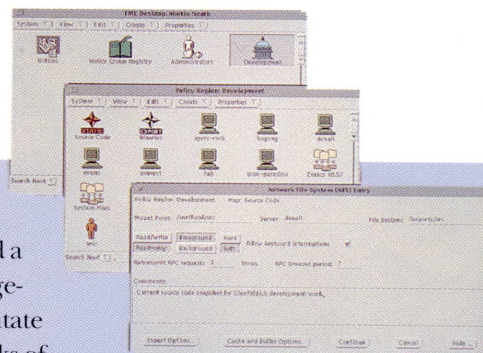
Tivoli/FSM provides a graphical interface to file system management and is designed to automate the various tasks required to maintain file systems. The software is designed to allow system managers to group related sets of workstations, manipulate their network file system configurations as a single unit, define the files and directories they want to make available, "export" them to the network and designated workstations, make changes in file systems, and propagate them throughout the network quickly.

The Tivoli Management Environment is a set of software products for managing distributed computers and providing a simplified, proactive approach to managing distributed computers, reducing cost and complexity. The applications use a point-and-click interface.

Tivoli Release 1.6 will be available for the HP 9000 Series 700 and 800 systems in the third quarter of 1993. Pricing for Tivoli Release 1.6 starts at \$40,950 for a 50-node network, which includes the Tivoli Management Framework, Tivoli/Works, Tivoli/Courier, Tivoli/FSM, Tivoli/Sentry, and Tivoli/AEF. Tivoli/ADE is priced starting at \$30,000 for a three-seat developers' license.

Tivoli has also announced that 13 companies, including Landmark Systems and Legato Systems, will provide software or consulting services for the Tivoli Management Environment.

Contact Tivoli Systems, Inc., 6034 West Courtyard Drive, Suite 210, Austin, Texas 78730, ph: (512) 794-9070, fx: (512) 794-0623.





choose to work with the scanned image without taking the time to convert the entire drawing.

Smart Raster Technology is an extension of AutoCAD drafting tools for raster. It is designed to locate raster as easily as vector, allowing rapid and accurate image revision or conversion to vectors. ESP 4.0 also features new pop-up icons and pull-down menus. The Raster Snap command (Rsnap!) works inside any AutoCAD command. The raster-sensitive cursor automatically previews a snap point inside the pickbox, and tracking allows the cursor to snap to moving raster data.

A user can select raster geometry and interactively convert it to an equivalent vector entity and can correct or adjust dimensions before the underlying raster geometry is automatically erased. Vertical application tools can convert three-dimensional contours, boundaries, parcels, and text.

Contact Image Systems Technology, Inc., Rensselaer Technology Park, 385 Jordan Road, Troy, New York 12180, ph: (518) 283-8783, fx: (518) 283-8790.

### SCSI Hardware Interface

Ten X Technology has announced the Optical Conversion Unit (OCU), a SCSI hardware interface that provides compatibility of Alphasatronix Inspire II, a 5.25-inch, 650-MB, rewritable optical disk drive, to any SCSI-based computer. With the OCU, no software drivers are needed, and changes in computer or operating system will not adversely affect connectivity, the company notes.

A read/write cache is designed to speed data throughput. When read or write requests from the host computer are "hit" in the OCU cache, data transfers to or from the optical disk are

unnecessary. Cached data can be accessed in less than 1 millisecond, the company notes.

Ten X's Archive Mode provides the Inspire II's rewritable disk with the benefits of a WORM disk. A clear audit trail is established when data is written and flagged with a time stamp, and users can view the data exactly as written. If the data becomes obsolete, the disk can be reinitialized, returning it to its original rewritable state. Archive Mode also gives rewritable disks the advantage of data compression. Typical compression ratios range from 2:1 to 5:1, making it possible to store more than 3 GB on one 650-MB optical disk. This increased space means a decreased cost per megabyte.

The Optical Conversion Unit runs on the HP 9000 SCSI-based computers and is available directly from Ten X or through resellers and distributors. Prices

are from \$895 for rewritable disks to \$2,200 for 12-inch WORM and WORM and rewritable 1/4-inch disks.

Contact Greg Wise or Elizabeth Davis at ph: (800) 922-9050 or (512) 346-8360.

### Data Warehouse Development

Prism Solutions, Inc. has introduced a new release of software that transforms legacy data and operational applications into integrated information that can be accessed in UNIX or OS/2 client-server environments. Prism Warehouse Manager Release 2.0 is designed to allow enterprises to quickly and cost-efficiently build a data warehouse or informational database, providing a subject-oriented, historical base of information.

Warehouse Manager Release 2.0 is designed to automatically extract and integrate data, generate code, create and manage meta data, and build a data

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warehouse in the client-server environment on a database management system such as Oracle, Sybase, or Red Brick. The Oracle, Sybase, and Red Brick output modules support HP servers as well as other servers and environments. In Warehouse Manager Release 2.0, MetaSource captures and manages information about source files, output files, table definitions, data mappings, and data transformations. In addition to storing this information on the PC, Warehouse Manager uploads the meta data to the target database management system so it is accessible to all data warehouse users.

The software is designed to import data from CASE tools, data dictionaries, repositories, and to copy libraries without manual re-entry of data that already exists within the information systems environment.

With Warehouse Manager, users make menu-driven selections on a PC workstation to map source data to a target database. No programming is required. Warehouse Manager automatically generates COBOL programs to extract and transform data from IMS, VSAM, and sequential file structures. It then produces Job Control Language (JCL) and DDL statements with scripts to load data into a database management system such as Sybase, Oracle, Red Brick, or DB2.

Prism Solutions will support HP's OpenWarehouse program, whereby Prism and HP will jointly market their products and services to customers. Warehouse Manager Release 2.0 includes the basic software license, two input modules (VSAM and sequential files), and three workstation licenses priced at \$75,000. The DB2 output module is available for \$20,000. Server

### EDA/SQL Supports OpenWarehouse

Information Builders has announced its Enterprise Data Access (EDA)/SQL client-server software will be integrated with HP's OpenWarehouse. EDA/SQL and HP users will be able to access "warehoused" data on HP 9000 Series 800 servers as well as operational data located on legacy systems throughout an enterprise.

OpenWarehouse components of the HP Information Access and the Enterprise Information Server are enabled to EDA/SQL. EDA/SQL is designed to provide transparent access to enterprise-wide heterogeneous data residing in more than 50 different databases and file structures on 35 platforms, with connectivity to almost 100 third-party front-end tools and applications. Information Builders' support of HP's OpenWarehouse expands the company's participation in HP's Cooperative Computing Solution (CCSY), which uses EDA/SQL to access both relational and non-relational data across all enterprise platforms.

HP's OpenWarehouse data is extracted from operational data and stored in popular relational database management systems. This data can be transferred to an end user's desktop by data access and reporting tools.

Contact Information Builders, Inc., 1250 Broadway, New York, New York 10001, ph: (212) 736-4433, fx: (212) 967-6406.

licenses for Oracle, Sybase, and Red Brick output modules are priced at \$20,000. Additional input modules can be purchased for \$20,000. Prism offers a 5-day trial program and a 60-day pilot program to generate working prototypes of a data warehouse from a company's existing information systems.

Contact Prism Solutions, 440 Oakmead Parkway, Sunnyvale, California 94086, ph: (408) 481-0240, fx: (408) 481-0260.

### New from Sterling Software

#### *Financial EDI Program*

Sterling Software, Inc. has announced an Electronic Commerce initiative promoting financial EDI services. Financial

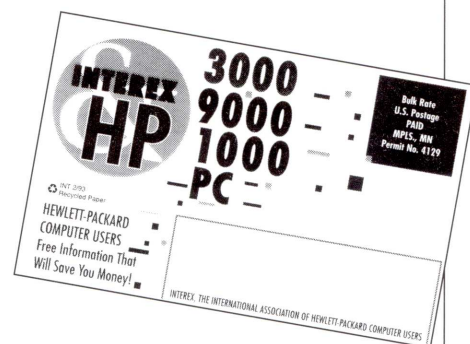
EDI completes the purchase order-payment cycle associated with the buying of goods and services. This part of the cycle brings the financial institution into the value chain to move funds electronically. For the payer, using financial EDI documents (the first being the 820-Payment Order/Remittance Advice) are designed to improve cash management functions and assure the accurate application of payment information. The payee benefits with enhanced cash forecasting, speedier resolution of payment discrepancies, and improved credit and collections. Sterling's Transaction Implementation Program (TIP) will begin with financial EDI documents.

TIP assists proactive EC businesses to



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94088-3439 USA, Phone (408) 747-0227, FAX (408) 747-0947.



### Floptical Technology

In an agreement with 3M, HP has announced support for 21-MB Floptical technology as a high-capacity removable storage solution for its PA-RISC workstations. HP will develop the driver software required for compatibility with HP Apollo 9000 Series 700 workstations. The two companies have also agreed to a joint marketing effort for the new Floptical capability.

The high-capacity diskettes are intended to provide computer users easy and cost-effective management of personal files, distribution software applications and large files, archiving of infrequently used data and applications, and extended life of hard drives. Floptical media is ideal for such data-intensive applications as graphics, multimedia, CAD/CAM, desktop publishing, and large text storage, the company notes.

Contact 3M, P.O. Box 33600, St. Paul, Minnesota 55133-3600, ph: (612) 736-5961.

implement new EDI transaction sets with their trading partners. TIP will assist companies in evaluating their readiness for new transactions, defining their objectives, building their implementation plan, communicating their plan via direct mail or trading partner conferences, putting their plan into action, and measuring results against objectives.

The program is available to any business, regardless of the transaction it is preparing to implement, from a simple 850 Purchase Order to a more difficult 856 Advance Ship Notice. The TIP initiative will also focus on the implementation of financial EDI transactions starting with the 820 Payment Order/Remittance Advice, targeted at assisting both banks and corporations.

### Agreement with Ross Systems

Sterling Software, Inc. and Ross Systems announced that they are entering into a marketing agreement in which Ross Systems will market Sterling's GEN-TRAN for the DEC VAX and GENTRAN

for UNIX EDI management software. The alliance is intended to provide an integrated EDI system for companies using Ross's PROMIX process manufacturing and distributed software.

Ross Systems, Inc. recently introduced the Renaissance CS Series, a suite of tightly integrated financial products built on a relational database and designed for client-server processing in an open systems environment. Ross Systems develops and markets business solutions in HP-UX, MPE/iX, and other open environments. Ross products encompass financial, human resources, and distribution systems, as well as manufacturing and public sector applications, complemented by a fourth-generation application development language.

### Acquisition of Systems Center

Sterling Software, Inc. also announced that its previous agreement to acquire Systems Center, Inc. was approved by stockholders of both companies and was completed successfully.

The stock-for-stock transaction represents a value of approximately \$156 million, excluding Systems Center options and warrants assumed in the merger. Sterling said the products and services it acquired in the merger complement its own product lines, and all of them will be fully supported.

Sterling said it has reshaped two of its major business groups—Systems Software and EDI—to combine complementary product lines and business services, and to assemble

related products under new "product family" names. Additionally, a new business group, the International Group, has been formed to consolidate Sterling's multiple operations outside the United States.

Contact Sterling Software, 4600 Lakehurst Court, P.O. Box 7160, Dublin, Ohio 43017-0760, ph: (614) 793-7000.

### Multimedia Products

MediaMagic, Inc. has announced the release of its MMB700 Series, reportedly the first true multimedia interface card and software for the HP 9000 Series 700. The product family provides on-board video, audio, and Joint Photographic Expert Group (JPEG) compression for full-motion scalable video in 24-bit true color, CD-quality audio, and compression (30 frames per second).

The total package permits real-time playback of audio and video from disk at 30 frames per second (fps), live video in a window or native mode, the capability to store and retrieve images in



multiple data formats, and a software developer's kit.

The standard configuration includes a video board, RGB connection, and VideoMaster application software. The single-slot EISA card is designed to enable the 700 workstation to perform true 24-bit full-motion analog video in a window, scalable live video up to 1,024 x 1,024 and multiple support of NTSE, PAL, and SECAM input formats with a variety of video source options. In addition, support for color and gray scale display monitors, push-button image freeze, and sequence grabbing at up to 15 fps is included. File storage of single-frame images is supported in RGB, TIFF, PPM, and JPEG.

VideoMaster, a Motif 1.1 software application, runs in conjunction with the video board. This product, combined with HP-UX 8.07 or later operating system, provides adjustment panels for window and hardware features, special effects such as multiple time-delay images and cropping, and user-extensible storage and retrieval panels for customer-specific file formats.

The optional audio product provides CD-quality audio for all Series 700 workstations. By adding the audio component, the workstation user can record and play back digital audio. Additionally, the product offers stereo microphone input, line-level input/output, stereo headphone output, 1-MB on-board buffer, and audio delay capabilities.

The MMB700 Series cost between \$2,495 and \$3,495, depending on configuration. A software developer's kit containing a user's guide, developer's manual, archive library, and source and sample code is also available within the same price range.

CompuTrac, Inc., announced it has

## New from MicroMechanics

### AT, SCSI Floppy Drives

MicroMechanics now offers SCSI- and AT-bus floppy drives for use with Domain/OS and HP-UX workstations. These floppy drives are intended to function as Domain/OS and HP-UX native devices and as PC floppy drives when using MicroMechanics' DPCC or DPCE, DOS emulation products. The products support 5.25-inch and 3.5-inch configurations.

Capabilities include PC-compatible operation, and the product works with Insignia Solution's SoftPC, dosls, doscp, etc., Xcelerated Systems' LikemacEmulation, and native-mode operation tar, mkfs, etc.

Prices for the drives range from \$695 to \$1,095.

### DPCI-OPEN

MicroMechanics has announced that DPCI can now operate in mixed networks on standards-based protocols, including Microsoft LAN Manager, Novell Netware, and Banyan Vines. DPCI interoperates with non-Domain networks through a complete TCP/IP protocol stack and application suite, and DPCI clients connect via the NetBIOS services over the TCP/IP stack, allowing one client simultaneous access to both HP-UX LAN Manager and Domain/OS file servers. The TCP/IP protocol stack supports NDIS-compliant network cards, including the complete 3COM Etherlink and HP Ethertwist families.

Configuration of the TCP/IP protocol stack minimizes memory use and saves 30 to 40 KB of conventional memory over previous DPCI transports, the company notes. The product's use of available EMS memory is said to reduce conventional memory requirements to approximately 35 KB total.

Contact MicroMechanics, 222 Third Street #2230, Cambridge, Massachusetts 02142, ph: (617) 868-1899, fx: (617) 494-6053, e-mail: umech!ljohnson@uunet.uu.net.

acquired 80 percent of the outstanding common stock of MediaMagic Corporation. MediaMagic will operate as a subsidiary from CompuTrac's corporate headquarters in Richardson, Texas.

Contact Media Magic, Inc., 222 Municipal Drive, Richardson, Texas 75080, ph: (214) 669-3408, fx: (214) 234-6280.

## Ether Board/HPL+II Interface

Eventide Inc. has announced that its WLZ-320 Ether Board Network Interface is fully compatible with Structured Software Systems' HPL+II operating system. HPL+II runs on all HP Series 200 and 300 machines (except model 237) and supports HP's Shared Resource



## New from Artecon

### Reduced Prices on SBus Products

Artecon has announced aggressive price reductions in their serial/parallel multiplexors and SBus expansion boxes. New prices are as follows:

- SB-300P (3 serial/ 1 parallel) \$ 395
- SB-400P (4 serial/ 1 parallel) \$ 495
- SB-800P (8 serial/ 1 parallel) \$ 695
- SB-1200P  
(12 serial/ 1 parallel) \$ 895
- SB-1600 (16 serial) \$ 995
- SB-3000XD, SB-6000X \$1,795
- SB-3100D, SB-6100X \$2,195

These reductions are the result of high-volume sales.

Artecon's SBus multiplexors have sustained serial transfer rates of 38.4 KB/second serial and 20 KB/second parallel port throughput. TTYTool, Artecon's proprietary OpenWindows GUI software, is bundled free.

Artecon's SMARTBox family of SBus expansion boxes feature three or six slots, master and slave support, auto configuration, and burst-through transfer. In addition, fast SCSI and Ethernet controllers are available on-board the SB-3100XD and SB-6100X models.

### Exclusive Marketing Agreement with SAIC

SAIC and Artecon have announced an agreement that makes Artecon the exclusive worldwide marketing agent for SAIC's Visual User Environment (SAIC VUE) 3.0.

SAIC, under license from Hewlett-Packard, has ported HP's Visual User Environment (HP VUE) desktop interface to both the Sun SPARC and IBM RS/6000 workstations. SAIC VUE 3.0 is visually and functionally identical to HP VUE 3.0, which is bundled with every HP 9000 Series 700 workstation.

SAIC VUE 3.0 has improved login/logout performance and decreased RAM usage, and is OSF/Motif Style Guide compliant, including full support of keyboard traversal. SAIC VUE components adhere to POSIX and ANSI C standards.

Key new features of SAIC VUE 3.0 include multicolor icons; backdrops and front-panel images; slide-up subpanels from the front panel; a bitmap/pixmap editor; a text editor targeted for novice users; a file annotator; desktop capability for placing files, directories, and executables directly on the root window; and online help built on the HP Help System.

SAIC VUE is now shipping on SPARC Solaris 1.X as well as RS/6000 AIX 3.2.X. A Solaris 2.X version was expected to be available by August 1993. A single-user license of SAIC VUE, including media and manuals, is priced at \$350. Right-to-use quantity pricing is also available, ranging from \$280 per copy for 2 to 25 users to \$175 per copy for 251 to 500 users.

Artecon's one-year onsite warranty applies to all of these new prices.

Contact Mark Reifler at Artecon (619) 931-5500, Jim Richardson at SAIC (619) 546-6422, or Alex Dunnette at Hewlett-Packard (503) 750-3886.

Manager (SRM) and SRM-UX networking systems. With SRM-UX, the file server is a standard UNIX (HP-UX) machine, and data files can be exchanged with UNIX programs, the company notes.

The WLZ-320 Ether Board is designed to give any HP Series 200/300 workstation full Ethernet access. With the Ether Board, these computers,

designed to be networked via SRM can function on an Ethernet LAN with a UNIX server. Ether Board networks do not require an additional SRM card in the server as HP's SRM card networks do, the company notes.

Before the Ether Board, there reportedly were great difficulties in networking Series 200 computers because the BOOTROM in these machines does not

recognize a LAN card. With the Ether Board, HPL+II can be booted directly from a server over the Ethernet. No local disk storage is required.

In addition to HPL developments, Structured Software Systems recently announced that the BTL software for controlling HP 3060A, HP 3061A, HP 3062A Board Test Systems has been upgraded to work with the HPL+II





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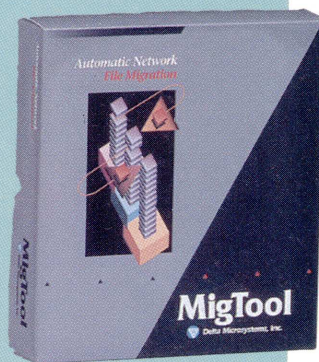


### File Migration Subsystems

Delta Microsystems has announced shipment of MigTool Subsystems, a file migration series that is designed to automatically manage the migration of files between magnetic disk and optical libraries. The product is available on the HP 9000 and is reportedly the industry's first UNIX file migration solution available for non-proprietary heterogeneous environments. With MigTool, users do not have to modify the kernel or existing UNIX file system. MigTool also is reportedly the first file migration package to offer a graphical utility that analyzes disk usage across the network and automatically alerts system administrators and users to important statistical information to help manage disk space more efficiently.

Delta offers MigTool Subsystem packages that include an erasable optical library system, file migration software, and a device driver. These subsystems are sold together, providing storage capacities of 10, 20, 60, and 100 GB. Upgradable paths are available. Suggested list price starts at \$32,420.

Contact Delta Microsystems, Inc., 5039 Preston Avenue, Livermore, California 94550, ph: (510) 449-6881, fx: (510) 449-6885.



**Delta Microsystems, Inc.'s MigTool**

operating system. These systems can connect multiple-board test systems to a common file server, allowing convenient file sharing and centralized backup. The WLZ-320 Ether Board costs \$995. Multiple purchase discounts are available.

Contact Eventide Inc., One Alsan Way, Little Ferry, New Jersey 07643, ph: (201) 641-1200, fx: (201) 641-1640.

### Backup and Restore Engine

Workstation Solutions, Inc. has introduced its Quick Restore (QR) backup and restore for enterprise-wide UNIX networks. The product features a graphical user interface (GUI), a LibMan

library management module, and other advanced capabilities.

QR is designed to control local and remote backups and restorations from any point in a heterogeneous network. QR can locate a file or directory for restoration anywhere on a backup tape without reading data sequentially, reportedly restoring files 50 times faster than conventional methods, the company notes.

QR's graphical user interface addresses requests to restore lost or damaged files. The GUI offers a basic mode for end users and a power mode for network administrators.

The LibMan library management module is designed to ease the task of managing very large UNIX networks. LibMan provides tracking mechanisms to locate not only the data stored on a volume, but to find the volume itself: in a robotic device, on a shelf, or in an off-site vault. When a volume is robotically accessible, LibMan can load the volume onto a drive and restore data from that volume.

QR supports HP-UX and other UNIX platforms. The base price of the QR engine is \$2,950. Contact Workstation Solutions, One Overlook Drive, Amherst, New Hampshire 03031-2800, ph: (603) 880-0080, fx: (603) 880-0696.

### SCSI for HP BASIC/WS

RMBtech announces a software product for HP BASIC/WS users providing backup and streaming tape data logging support for a variety of SCSI-based digital data storage (DDS), QIC, and 8-mm tape drives.

The product, STAPE, includes a separately loadable HP BASIC binary, utilities, and user documentation for HP BASIC/WS Version 6.x or later. The product is supported on all HP 9000 Series 200/300 computers equipped with a SCSI interface.

The binary provides low-level support for HP SCSI-based DDS tape devices and SCSI-based QIC and 8-mm (Exabyte) tape devices from IEM. This binary enables SCSI tape devices to be used as backup mechanisms, and tapes can also be manipulated directly from users' programs with HP BASIC statements like CONTROL, STATUS, and TRANSFER.

An enhanced HP BASIC utility program is also provided for creating and



restoring cpio-compatible archives, including support for multiple archives per tape. The utility can back up complete file systems or user selected files, directories, or individual mass storage devices.

The product is available for \$695 (U.S.), including binary and utility software on a 3 1/2-inch floppy disk and user documentation.

Contact RMBtech Inc., P.O. Box 1889, Fort Collins, Colorado 80522, ph: (303) 221-3005, fx: (303) 221-1909.

## New from Cincom

### *Distributed Applications*

Cincom has announced distributed SUPRA Server for HP-UX and other UNIX platforms. Support for the 32-bit version of OS/2 R2 from IBM is also included. Client applications available on Windows, MS-DOS, and Apple Macintosh can transparently access SUPRA Server on any available platform, the company notes.

SUPRA Server is designed for development of enterprise-wide, mission-critical, distributed applications employing client-server and server-to-server networks. It is the backbone of an information utility supporting new multimedia, object-oriented, and knowledge-based systems that can be deployed on a wide range of platforms and networks. The product is designed to provide users with a true single-system image for transparent management of distributed data and to allow data storage at the local level, on a departmental server, or on the mainframe. It also offers several distributed attributes including distributed transaction management, distributed updatable join

views, distributed integrity enforcement, distributed optimization, etc.

SUPRA Server costs \$1,500 to \$200,000, depending on the number of users and supporting tools.

### *Enterprise Management*

Cincom Systems also announced CPCS Enterprise Management and Guidance System availability for HP-UX. The system is designed to allow management to plan and monitor almost any process in an organization. Up-to-the-minute information on an entire organization is provided online, in reports, or graphically to users.

CPCS is designed to aid in planning, tracking, scheduling, controlling, modifying, or guiding individual or enterprise-wide processes, projects resources,

activities, and/or expenses. If currently using in-house or PC-based project management systems, CPCS can combine or consolidate the different information.

It is available on HP-UX and other environments, with Windows-based PC workstation planning tools also available. Availability in other UNIX environments will be announced later this year. Pricing for CPCS starts at \$12,000 and is based on number of users.

### *Request Tracking*

Cincom Systems has also announced availability of CPCS Request Tracking System, an optional component for Cincom's CPCS Enterprise Management and Guidance System.

The CPCS Request Tracking System is designed to allow users to enter,

## FacetTerm Distribution, Lotus 1-2-3 Bundling

Dickens Data Systems and Structured Software Solutions have announced an agreement that enables Dickens to begin distributing Structured Software's FacetTerm session and window manager. In a related agreement, the two companies joined with Lotus Development Corporation to announce that Dickens will offer a bundle to include a 6-user Lotus 1-2-3 license and a 16-user FacetTerm license for \$1,895 (\$1,045 off of the regular list price of \$2,940). The bundled package is available on HP-UX and other UNIX systems.

FacetTerm is a software interface designed to enable character terminals, Alpha Window terminals, and personal computers to access a UNIX host and run up to 10 simultaneous sessions for all existing character-based UNIX applications. This provides a user with simultaneous access to spreadsheet, word processing, database management, and other applications. The product also provides the ability to perform screen print operations, cut and paste between applications, and enabling of a printer attached to the terminal as a shared device. The list price of FacetTerm begins at \$495.

Contact Dickens Data Systems, 1175 Northmeadow Parkway, Suite 150, Roswell, Georgia 30076, ph: (404) 475-8860, fx: (404) 442-7525.



document, and monitor the progress of work requests. The system also enables departments in a business or governmental agency to plan, prioritize, schedule, manage, and control user work requests from inception to completion.

The product's features include daily review of requests that have been submitted or assigned, automatic creation of request statements, assignments of requests, and delegation and initiation of work. The system is designed to accommodate various development plans by allowing multiple requests to be grouped within a project, with each request being a phase or activity within that project, one request to initiate one project, and one request to initiate multiple projects. The online query facilities allow users to determine the status of one or more requests at any time. CPCS Request Tracking System costs \$15,000 per site.

Contact Cincom Systems, Inc., 2300 Montana Avenue, Cincinnati, Ohio 45211-3899, ph: (513) 662-2300, fx: (513) 481-8332.

### Company Name Change

Nth Portable Graphics, Inc. is dropping the "Nth" from its name, finalizing its split from Nth Graphics, Ltd. last October. Portable Graphics, Inc., as the company will now be known, develops and sells the NPGL library, a hardware-independent library designed to be fully compatible with the Silicon Graphics IRIS GL 4.0 library. With NPGL, software developers can port existing three-dimensional visualization applications from the Silicon Graphics platform to other workstation platforms in a matter of days, the company notes.

Contact Portable Graphics, Inc. at (512) 908-4707.

## New from IKON

### Performance Enhancements

IKON Corporation has announced significant performance enhancements for a number of its board-level interface products. Effective immediately, all products currently employing FIFO buffers, which have used a 512-byte FIFO, will be shipped with 4-KB parts at no additional charge. The products affected by this update (which does not alter hardware form, fit, or function or require any software driver changes) include the following:

- Model 10099 VMEbus "Ultimate" DR11-W Emulator: Input and output FIFO buffer depth is now increased from 2 KB to 16 KB in each direction.
- Model 10111 ISA/EISAbus Hardcopy Interface: The FIFO buffer depth for this Versatec and Centronics interface is up from 512 bytes to 4 KB.
- Model 10103 SBus DR11-W Emulator: Both input and output FIFO buffers are increased from 512 bytes to 4 KB.
- Models 10104/10105/10106 SBus Hardcopy Interface: These three boards (Versatec Differential, Versatec TTL, and Centronics, respectively) will now have 4 KB of FIFO buffer instead of 512 bytes.

These products are shipping now and come with a hardware/software manual, a full one-year warranty, and coverage by IKON's unlimited, no-cost emergency field loan program. Software drivers, including source code for both SOLARIS 1.x and 2.x are delivered with the SBus products. An HP UNIX driver, again with source code, is provided with the 10111. Even deeper FIFO depths are available as options.

### Hardcopy Support for ISA/EISA

IKON's Model 10111 ISA/EISA bus maintains the ISA (PC/AT bus) form factor and software compatibility with the earlier Models 10092 and 10097, but now includes on-board FIFO and incorporates the enhanced DMA modes of the EISA bus as well. DMA Mode B, tri-state capable DMA, interrupt logic (allowing channel/level sharing), and level mode interrupts are now supported. The 10111 can use either 8- or 16-bit DMA channel. The board runs in DMA demand mode with eight transfers per bus request. Bus-to-FIFO transfer rates are 4 MB/second for EISA applications and 1.5 MB/second maximum, the company notes. Byte swapping may be selected for word DMA transfers.

The 10111 allows connection to any Versatec-compatible plotter or printer with either TTL or differential (Long-Lines) interface, as well as any Centronics-compatible device. Various special Centronics variations are also provided through socketed input terminators (with spare networks mounted on the board). Special handshaking and timing options are on-board for use with some higher performance Centronics devices, such as Tektronix data streaming mode for their color copiers.

Single-piece pricing is \$575, with OEM discounts available. IKON will provide units for evaluation at no charge.

Contact IKON Corporation, 2617 Western Avenue, Seattle, Washington 98121, ph: (206) 728-6465, fx: (206) 728-1633.



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## New from Siren Software Corporation

### *Fax Server*

Siren Software Corporation has announced Siren Fax, a networked fax server with both Motif and command-line client interfaces. Siren Fax is designed to provide point-and-click fax power with mission-critical security, capacity, reliability, and configurability. With a single-user request, Siren Fax can send multiple documents to many fax numbers simultaneously. Its smart scheduler is designed to prioritize jobs, take advantage of discount phone rates, retry unsuccessful calls, restart terminated calls, and manage fax modem loads. Siren Fax also maintains the confidentiality of incoming faxes and delivers them to users' desktop displays. In addition, it is designed to integrate with third-party products and internally developed applications.

Siren Fax is available immediately and runs on a variety of UNIX platforms, including HP 9000. Other ports will be made available according to customer demand.

A single-user license for Siren Fax is priced at \$995 and includes the Motif and command-line interfaces and Siren Fax Server, with support for several file formats including PostScript. In multi-user configurations, the Siren Fax Server is priced at \$1,995 and includes a line license. The Siren Fax Motif user agent is priced at \$149 per user or \$695 for a one-user floating license.

### *Text Editor*

Siren Software Corporation has announced Siren Editor, a Motif-based text editor that runs on several UNIX platforms and is designed as an alternative to control-key editors such as *vi* and *emacs*. Siren Editor also include

multi-file window management, a column-mode editing capability, a shell facility and auto-save, auto-backup, and auto-recovery facilities.

The text editor is designed to allow users to edit files with lines of any length, undo editing actions multiple times to correct mistakes, preserve original line numbers to debug source code and scripts, run external UNIX commands and scripts that create and process file contents, print or save all or any portion of a file, save files periodically, and create backups and crash recovery files automatically, edit many files at the same time, split windows to view two parts of a file simultaneously, store and retrieve frequently used text in user-named buffers, search and replace text in a selected area or in an entire file, and cut, copy, and paste text using the mouse, pull-down menus, or control-key accelerators. Users can customize Siren Editor's key mappings, macros, colors, fonts, and functionality as well.

Siren Editor 1.0 is available immediately and runs on a variety of UNIX platforms, including HP 9000. Other ports will be made available according to customer demand. A single-user license of Siren Editor is priced at \$249, a 5-user license is \$995, and a 10-user license is priced at \$1,795. Additional discounts and floating-license options are available for larger sites. The Siren Editor package includes a user's guide, magnetic media, installation instructions, 30 days of installations support, and a 30-day money-back guarantee. Technical support, upgrade, and maintenance contracts are available.

Contact Siren Software at (415) 322-0600 or (800) 45-SIREN.

## New from IEM

### *On-Site Service for the U.K.*

IEM Europe now offers "on-site service" for its range of mass storage, tape backup, and optical products on the

U.K. mainland. The agreement reached between IEM Europe and the Hewlett-Packard Multi-Vendor Support Group means that IEM will be able to offer next-day response (Monday-Friday 9 a.m. to 5 p.m.) or four-hour response (Monday-

Friday 9 a.m. to 9 p.m.) for products purchased through IEM Europe or one of its authorized resellers in the U.K.

The service is available on DAT tape products, DAT autoteaders, 8-mm tape products and 8-mm autoteaders, and HP-IB



or SCSI interfaces for connection to HP 1000, HP 3000, and HP 9000 systems.

For customers in the U.K., contact IEM Europe at (+44) 0608 645000, fx: (+44) 0608 645155.

### Floppy Disk Drives

IEM, Inc. has released floppy disk drives for Hewlett-Packard 1000 and 9000 computers with SCSI or HP-IB interfaces.

IEM's dual floppy disk drive, model 5633, attaches via an HP-IB interface and is functionally equivalent to HP's discontinued 9122C floppy disk drive, the company notes. The dual drive supports all format modes supported by the 9122C, including format mode 4. IEM also manufactures a single floppy drive, model 5630S, which uses the SCSI interface. Each drive is covered by a one-year warranty.

### New SCSI Winchester

IEM, Inc. has announced high-speed fixed and removable Winchester disk drives in a range of capacities. These drives attach via a SCSI interface and offer compatibility with HP 9000, 3000, and 1000 computers.

IEM's new fixed Winchester drives are available in capacities of 170 MB, 525 MB, 1.2 GB, and 2 GB. Removable Winchester drives can be ordered in 170 MB, 525 MB, and 1.2 GB capacities.

### Budget-Saving Peripherals

IEM has expanded its line of peripherals for HP computer users, adding a number of low-end disk drives and tape drives. These new drives combine IEM's traditional internal drive mechanisms with less expensive drive enclosures.

Included in the new line of peripherals are disk drives in a range of capacities from 170 MB to 2 GB, DAT drives

OUR 13th YEAR

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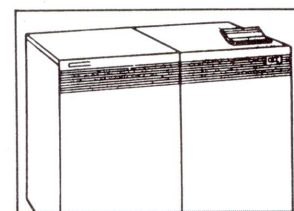
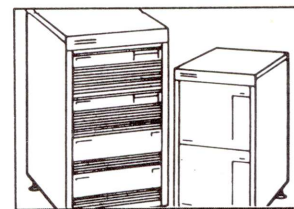
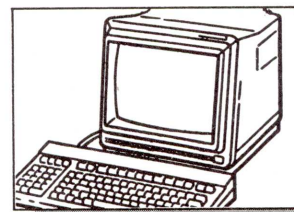
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with and without data compression, 8-mm tape drives with and without compression, and QIC tape drives.

### IEM and Hall-Mark Electronics Agreement

IEM has signed a distribution agreement with Dallas-based Hall-Mark Electronics Corporation. Hall-Mark is said to be the largest distributor of HP workstations, with 34 distribution centers throughout the country. Representing nearly 80 "blue-chip" manufacturers, Hall-Mark is one of the nation's largest distributors of semiconductors, passive and electromechanical devices, and computer system products.

Contact IEM, Inc., 1629 Blue Spruce Drive, Fort Collins, Colorado 80524, ph: (303) 221-3005, fx: (303) 221-1909. Contact IEM Europe at ph: (+44) 0608 645000, fx: (+44) 0608 645155.

### ANI Integration

Metrix Customer Support Systems, Inc. (MCSS) has announced the integration of Automatic Number Identification (ANI) with its Open UPTIME service management product line, enabling Open UPTIME to automatically identify incoming calls through phone switching devices.

Through Automated Call Management (ACM), OpenUPTIME is designed to recognize incoming phone numbers, finds a match in an existing relational database, and populates a call-taking screen with customer information, including address, phone number, main contacts, and product/equipment installed.

With this technology in place, customers calling in for support need only provide their name and can state their request for service or support, according



to the company. This process has been reported to save from 10 to 45 seconds per call.

OpenUPTIME currently supports switching devices for ACM for Northern Telecom and AT&T. Other devices are scheduled for inclusion in later releases of the ACM module. OpenUPTIME is available for Hewlett-Packard, IBM, DEC, Sun, and LAN environments running Sybase, Oracle, Ingres, Informix, ALL-BASE, and Rdb.

Contact Metrix Customer Support Systems, Inc., 20975 Swenson Drive, Waukesha, Wisconsin 53186-4064, ph: (414) 798-8560, fx: (414) 798-8573.

### Real-Time Database Access

Comsci Data Systems, Inc. has announced DBAccess/1000, software that provides real-time access to IMAGE databases on HP 1000s from HP 9000 Series 700s and 800s and PC platforms over both serial RS-232 and LAN communication links.

With DBAccess, application software running on non-HP 1000 clients can retrieve and update critical information using the familiar IMAGE/1000 application programming interface (API). DBAccess includes complete HP 1000 server administration software and an extensive set of library routines for DOS and HP-UX client systems.

DBAccess is designed to provide full read/write capability plus rollback commitment, automatic conversion of binary values, and concurrent access to 20 databases. DBAccess is designed to eliminate time-consuming file transfers and batch operations, simplify migration to other platforms, update all databases with a single program, and allows development of IMAGE applications using the latest tools.

DBAccess is available immediately and is priced from \$1,750, which includes software for the HP 1000 host plus one client.

Contact Comsci Data Systems, P.O. Box 500595, Atlanta, Georgia 31150-0595, ph: (404) 552-9499.

### New from Insignia Solutions

#### *SoftPC 3.1 with Windows for HP Workstations*

Insignia Solutions Inc. and Hewlett-Packard have announced SoftPC 3.1 with Windows for HP 9000 PA-RISC and Motorola-based workstations at a new price of \$549. SoftPC with Windows is designed to enable HP users to run MS-DOS and Microsoft Windows applications on their workstations. This new business relationship between Insignia and HP is designed to provide HP workstation users with the earliest possible access to Insignia's technology and support.

SoftPC enables HP workstation users to share data and applications with PC users. SoftPC with Windows provides compatibility with MS-DOS and Microsoft Windows applications, giving HP workstation users access to a host of productivity applications previously unpublished for UNIX workstations. SoftPC 3.1 with Windows adds support for HP's Motorola-based workstations and includes Microsoft Windows 3.1, emulating the functionality of a 486 PC. Included are real and protected mode support as well as support for expanded and extended memory, which is designed to allow users to run PC applications requiring more than 640 KB of conventional PC memory. SVGA, EGA, CGA, and Hercules graphics are supported. In addition, floppy disk drive support and MDA support for serial ter-

minals are provided. The program also emulates an 80287 math co-processor. Initial right-to-use licenses are \$549 with additional licenses starting at \$429. Upgrades are \$249.

#### *VAR/Reseller Program*

Insignia Solutions Inc. has announced a new program for direct distribution of its packaged UNIX products to resellers and value-added resellers (VARs). The program will provide certified resellers and VARs with a range of benefits including training, discount pricing, free demonstration copies, qualified leads, and technical assistance.

Contact Insignia Solutions, 526 Clyde Avenue, Mountain View, California 94043, ph: (415) 964-7600, fx: (415) 964-5434.

### Security Toolkit

Raxco Inc. has announced Security Toolkit/UNIX (STK/U), a comprehensive security assessment tool for UNIX systems. STK/U is designed to eliminate the time-consuming processes that would normally be done separately. STK/U is equipped with reporting and sorting features that allow managers to quickly assess the state of their security. Version 2.1 includes enhancements that will further facilitate automating the regular and systematic security checks and ensure proper system security implementation across UNIX networks. STK/U is available on the HP 9000 Series 300, 400, 700, and 800 and other platforms. The product is designed to execute security assessment modules simultaneously on many systems across the network with a single-menu selection, allowing users to get a quick overall look at the network security problems, either host-by-host or with a network summary.



It also produces customized online and printed reports that display informational analysis on each selected security issue. The reports can be generated in three formats: short, medium, and long. The long reports include a full paragraph of text explaining what problem was detected, why it is a security concern, and what the user would do to correct the problem.

The user can assess networked systems' security through Motif and OpenLook GUIs or with Raxco's own character cell version of the menu interface (for those supported platforms without X Windows). The user can also evaluate the network's security in real time.

The product is designed to check files and directory attributes to assure access is granted only to authorized users, and the toolkit provides a baseline snapshot of the system to determine if files or attributes have been altered.

Full client-server capabilities can run an STK/U module simultaneously on many systems with a single command and maintain the STK/U databases remotely. A command line interface runs STK/U from a script file and/or from cron. A View Summary provides a network-wide summary of problems found for each module, and a Suppress option suppresses and unsuppresses the reporting of any problem in the current report and any future runs on the module.

Contact Raxco Inc., 2440 Research Blvd, Rockville, Maryland 20850, ph: (301) 258-2620, fx: (301) 330-5756.

## NEXTSTEP on HP

NeXT Computer, Inc. has announced business solutions on HP's UNIX workstations and business servers. Object Enterprise combines NEXTSTEP, NeXT's object-oriented software, with

## Mail Administration

Enterprise Solutions Limited has announced initial availability of the first Enterprise Mail Administration module. Based on Enterprise Solutions' open X.400/X.500 mail solution and selected environments based on third-party X.400 message transfer agents (MTAs), ES/ADMIN software modules are designed to automatically configure themselves to best serve the environment in which they are installed. ES/ADMIN runs on HP 9000s.

Enterprise Mail Administration software modules can be used with one Mail Server or with hundreds of Mail and Directory Servers spread throughout the world, the company notes. The ES/ADMIN system is designed to administer and control the entire network from one central station, even in installations where the network contains many different brands of computers and operating systems. The wide-ranging functionality of ES/ADMIN includes the installation of new network nodes, the maintenance of user accounts, performance analysis, and the establishment of privilege levels.

The software is designed to simplify all mail administration tasks. The menu-driven user interface is designed to show only those options relevant to the immediate task, and the menus, icons and/or toolbars are built to reflect different levels of user privileges and different software and hardware configurations.

ES/U-ADMIN provides for distributed user account management. Managers may add, delete, and modify accounts by filling out a simple screen form, depending on assigned privileges. Users reportedly can be added and deleted automatically, and other applications can modify the user database as their internal database changes to reduce instances of misdirected mail. ES/U-ADMIN also provides for the creation and management of distribution lists, including dynamic updating when reused, and distribution list expansion which can be set to be optimized for the environment.

The first module release of ES/ADMIN, the ES/U-ADMIN module, is now shipping and includes all levels of user account management and distribution list management. Future releases will offer complete mail system accounting and central network configuration management and diagnostics. Pricing for the first module begins at \$1,295, with volume discounts available.

Contact Enterprise Solutions Limited, 32603 Bowman Knoll Drive, Westlake Village, California 91361, ph: (818) 597-8943, fx: (818) 597-9621.



## Interface Design Software

Altia, Inc. has announced the newest version of its interface design software, Altia Design 1.2. Altia Design is used by product developers to quickly create graphical prototypes and designs of custom user interfaces without writing graphics code or requiring a software specialist. Unlike GUI builders or graphics toolkits, which use a limited set of standard user-interface components, Altia Design is said to enable designers to create fully custom dynamic user interfaces that accurately simulate their physical counterparts and display real-time data and information.

Altia Design features graphical editor to assemble "pre-built" graphical components such as buttons, meters, dials, CRT displays, trackballs, and keypads. The product also features a suite of interactive animation features, full control over input stimulus, and code connection features designed to allow designers to link external software for data feeds and modeling instrument behavior. Record and

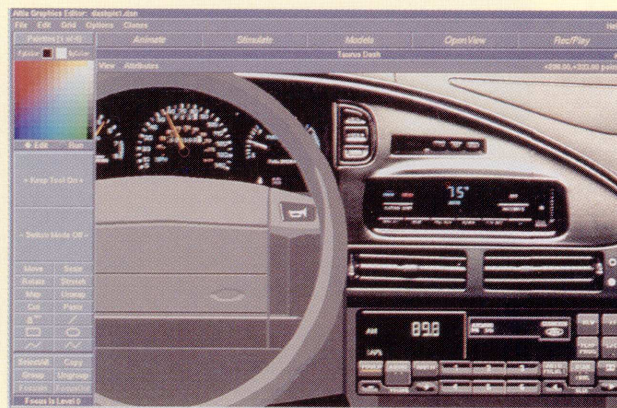
playback capabilities are included to capture user interaction and gather human factors data. Finally, a run-time version is provided for software integration into the actual instrument or system product.

Altia Design 1.2 also features an absolute coordinate and dimensioning system, which is intended to allow designers to create interfaces to exact physical specifications. In addition, Version 1.2 supports importing color bitmaps from other design systems or scanners the Tadpole SparcBook, a portable SPARC-compatible workstation. Altia designs can be integrated with existing Motif or other

X Windows applications.

A complete Altia Design system costs \$7,900 for a single license, with discounts for multi-license purchases. Contact Michael Juran, Altia, Inc., 5030 Corporate Plaza Drive, #200, Colorado Springs, Colorado 80919, ph: (719) 598-4299, fx: (719) 598-4392.

**Altia, Inc's Design 1.2**



the HP 9000 product family, providing a client-server solution based on object-oriented technology for the financial services industry. Object Enterprise is designed to enable customers to develop and deploy object-oriented applications across the enterprise.

As part of Object Enterprise, NeXT will provide the following three key products:

- NEXTSTEP Release 3.1, NeXT's object-oriented software, expected to be available on HP Apollo 9000 Series 700 workstations in mid-1994.

- Portable Distributed Objects (PDO) for the HP 9000 Series 800 business servers running HP-UX, expected to be available in the fourth quarter of 1993. PDO is designed to provide a basis for deploying object-oriented applications across the enterprise.
- NetInfo network management software for Series 800, expected to be available in the fourth quarter of 1993.

Object Enterprise also will integrate NEXTSTEP and key distributed computing standards including OMG's

CORBA and OSF's DCE and DME.

The PDO software, which includes an Objective-C compiler and run-time environment, is designed to allow developers to create flexible, scalable applications that take full advantage of client-server networks. NetInfo for the Series 800 allows centralized management of NEXTSTEP-based clients and server. NetInfo will provide management capabilities that interoperate with HP OpenView network and system management environment.

Contact NeXT, 900 Chesapeake Drive, Redwood City, California 94063.



### Memory Guide

Helios Systems has introduced its first Memory Upgrade Guide, a 47-page compilation of its memory products that features easy-to-read configuration charts for equipment from Hewlett-Packard, Sun Microsystems, and other manufacturers. Helios plans to update the guide every six months to keep it current. A disk version of the guide is also planned.

All Helios Systems memory is guaranteed to be 100-percent compatible with manufacturers' equipment and comes with a 30-day, money-back guarantee and lifetime warranty. The guide is available at no charge.

Contact Rand Steyer, vice president/general manager, or Jeff Chapman, director of marketing, Helios Systems, 1996 Lundy Avenue, San Jose, California 95131, ph: (408) 432-0292 or (800) 366-0283, fx: (408) 452-4549.

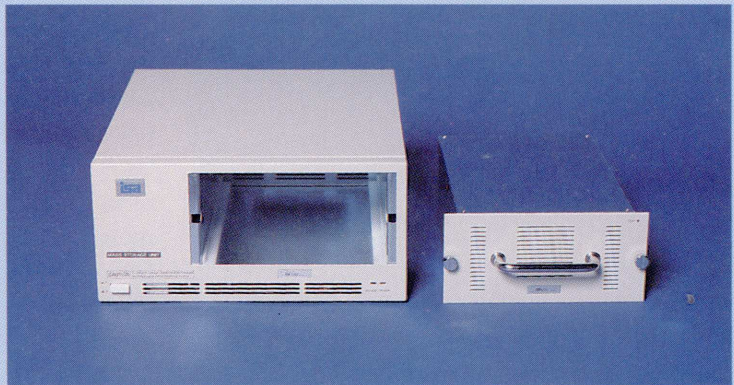
### International Internet Access

NovaLink Information Service announces local access to the Internet. Now anyone may explore the Internet, including its commercial backbones, by placing a local phone call to one of NovaLink's thousands of high-speed access numbers located across the world.

NovaLink is an online service accessible through over 1,000 cities internationally via local dialups provided by CompuServe Packet Network, British Telecom's TYMNET, and every regional Bell packet network. Subscribers use any computer equipped with a modem, place a call to a local phone number, and are switched to NovaLink, where they may access a number of services including electronic mail, file libraries, interactive entertainment, and other telecommunications products.

## Security & Performance

### ISA Removable Hard Disk Family



#### ISA 2081R

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3.5 inch  
HP-IB / SCSI  
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5.25 inch  
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Media : Fujitsu

#### ISA 2082R

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HP-IB / SCSI  
Media : HP

#### ISA 3120

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CIRCLE 54 ON READER SERVICE CARD



### Recovery Services

SunGard Recovery Services Inc. has announced a major program of investment in new technology and expansion of existing capabilities. Investments include the addition of IBM ES9000 mainframe services, UNIX-based services, and PC-based LAN server capabilities as adjunct support for mainframe services.

SunGard's mainframe expansion program includes the introduction of a PC-based LAN server capability that will serve as an adjunct platform service for subscribers' primary systems. It also includes the expansion of ready-conditioned space in SunGard's Philadelphia MegaCenter to 25,000 contiguous square feet to accommodate subscribers' future needs.

SunGard's expansion program for UNIX-based recovery services includes expanded Hewlett-Packard services that reportedly strengthen SunGard's position as the largest provider of HP recovery services.

Contact SunGard Recovery Services Inc., 1285 Drummers Lane, Wayne, Pennsylvania 19087, ph: (215) 341-8700.

NovaLink is designed to provide subscribers with full Internet access, including the following features: electronic mail, UseNet news (a massive assortment of "message boards"), ftp (file transfer protocol), telnet (the protocol used to remotely access other computers and programs on the Internet), and more. NovaLink is attached to networks such as the CIX (Commercial Internet Exchange) and ANS/CORE, so in addition to academia and research, subscribers may pursue business and entertainment interests not permitted

over the National Science Foundation's backbone.

Individuals may subscribe to the NovaLink Information Service via modem by dialing (800) 825-8852, and interested people may also speak to a customer service representative at (800) 274-2814. Charges are a total of \$6 per hour through most local access numbers, regardless of time of day or connection speed.

Contact Angela Bull, Inner Circle Technologies, Inc., P.O. Box 11, Shrewsbury, Massachusetts 01545, ph: (508) 842-7227, e-mail: bull@novalink.com.

### Help Desk Support

Answer Computer has announced that its Apriori problem-resolution and call-tracking software system is available

for HP 9000 servers and workstations. The new Apriori release follows HP's recent announcement that it has extended its OpenView network management platform.

OpenView provides HP users with an online, centralized view of performance and use trends on distributed networked systems. The Apriori help desk software, which is also distributed, is designed to assist help desk support personnel in quickly and effectively answering user questions and solving problems.

Apriori is designed to learn and prioritize problems and solutions. After

only two to three months, users are able to solve over 80 percent of the problems on the first call, the company notes. Modules are available to provide call management support and reports, remote read-only capabilities, and full text retrieval of hardware/software documentation. Apriori support for the HP 9000 and other UNIX-based open-system servers and networks is available with prices starting at \$40,000.

Contact Louise Kirkbride, Answer Computer, Inc., 1263 Oakmead Parkway, Sunnyvale, California 94086, ph: (408) 739-6130 or (800) 677-2679, fx: (408) 739-2455.

### Motif GUI Builder

CenterLine Software Inc. and Visual Edge Software Ltd. have announced the availability of ViewCenter for Motif. Based on the latest release of Visual Edge's Graphical User Interface (GUI) builder—UIM/X 2.5—the product includes integration with CenterLine's CodeCenter and ObjectCenter UNIX programming environments.

ViewCenter for Motif is the second offering in CenterLine's ViewCenter user-interface development product line for C and C++. It is designed to enhance programmer productivity by enabling software developers to interactively create, modify, test, and generate code for the user interface portion of their applications. ViewCenter for Motif fully supports Release 1.2 of Motif and generates C++ UI code and GUI-class object components, enabling users to create reusable GUI objects that comply with the Object Management Group's COBRA API specification.

ViewCenter for Motif is designed to enable software developers to create GUIs interactively, in a fraction of the



time necessary for manual interface development. ViewCenter for Motif can be used to create interfaces that may be ported readily across platforms and to create iconic interfaces for existing character-based applications.

The product is tightly integrated with CenterLine's CodeCenter and ObjectCenter UNIX programming environments, enabling Motif developers to automatically load GUI code into CodeCenter and/or ObjectCenter and use CodeCenter and ObjectCenter text editors for writing GUI callbacks, GUI object declarations, etc. In addition, ViewCenter for Motif uses both the standard CenterLine installation procedure and the standard CenterLine license manager.

ViewCenter for Motif is scheduled for availability in Summer 1993 for \$2,995 in the U.S. ViewCenter for Motif will support Sun workstations and Hewlett-Packard workstations running HP-UX 9.0.

Contact CenterLine Software, Inc., 10 Fawcett St., Cambridge, Massachusetts 02138-1110, ph: (617) 498-3000, fx: (617) 868-6655.

#### **NETstor OEM Agreement**

NETstor, Inc. and Hewlett-Packard Company have announced the signing of an original equipment manufacturer (OEM) agreement to incorporate NETstor's hierarchical online mass-storage software as an integral part of HP's OpenView storage management solutions.

Under the agreement, NETstor will port its Hierarchical Storage Management (HSM) software to the HP 9000 and integrate the software with HP OpenView OmniBack and HP OpenView OperationsCenter system-management applications.

HSM software is designed to offer all applications on network nodes virtually

#### **Software Development and Maintenance**

ParaSoft Corporation has introduced Insight, for the development and maintenance of software products. Insight is designed to find errors whenever the program is executed, identifying the programming errors, memory reference errors, and algorithmic errors. The software pinpoints errors in UNIX system calls, C libraries, third-party libraries, and I/O statements, and verifies calling sequences and format specifiers for consistency and correctness.

For optimization, support, and maintenance of software products, Insight provides visualization and animation capability for all aspects of software execution. It is designed to display simultaneous, synchronized images of data values, memory access patterns, and the source code being executed.

The product is compatible with third-party debuggers and compilers and is non-intrusive, creating no additional files in other directories. It is designed to operate automatically on distributed system applications and runs on the HP 9000 and other workstations.

Insight is priced at \$995, regardless of workstation type. ParaSoft offers an unconditional, 30-day, money-back guarantee.

Contact ParaSoft Corporation, 2500 East Foothill Blvd., Suite 205, Pasadena, California 91107, ph: (818) 792-9941, fx: (818) 792-0819.

unlimited online storage capacity through an automatic and transparent migration of files between magnetic disks and optical-disk libraries. The product manages online storage for HP Apollo 9000 Series 700 and HP 9000 Series 800 systems and client disks with capacities of 20 GB to over the terabyte. Problem and error notifications from HSM are reported automatically via a color change on the HP OpenView map, improving an administrator's productivity through central management and monitoring. HP expects to release its HSM product called HP OpenView OmniStorage in the second half of 1993.

The products developed under this agreement will be marketed and supported by HP's worldwide organization.

These products will also be available from NETstor to value-added resellers and independent software vendors.

Contact NETstor, Inc., (612) 890-9367, e-mail: netstor-sales@netstor.com

#### **PC X Server Software**

Grapoint, Inc. has announced reduced pricing of its PC X server software products: X-One for DOS, X-One for Windows, X for Workgroups, and X for NT (future release).

X-One and X for Workgroups include integrated TCP/IP networking software (third-party TCP/IPs are also supported), local and remote window management, and XDM Login.

Grapoint's new pricing places their products at about half of competing



manufacturers' list prices, according to the company. Grafbpoint's goal in reducing the price of X-One is to provide reliable, easy-to-use products that are readily affordable. X-One (DOS) is connectivity software that allows a user easy access to workstation computers from a PC under MS-DOS. X-One (Windows) enables a user to access workstation applications on a PC while also running Microsoft Windows and MS-DOS applications. X for Workgroups, Grafbpoint's newest implementation of an X server, allows PC users concurrent access to X Window applications on a host computer while running Windows for Workgroups locally. X for NT, a PC X server designed specifically for the Microsoft Windows NT environment, will be available at the end of the year.

A single copy of PC X server software is \$249. A five-user pack costs \$995, and site licenses are available from \$135 down to \$60 per user. Grafbpoint is offering a \$99 upgrade to its installed user base of TGRAF and TNET Tektronix emulation software products and will upgrade any user of X-One product to any other Grafbpoint PC X server (including the Windows/NT version upon its availability) for \$99 per license.

Contact Grafbpoint, Inc., 1485 Saratoga Ave., San Jose, California 95129, ph: (408) 446-1919.

### Mentalix and Agfa Agreement

Mentalix, Incorporated and Agfa's Electronic Desktop Solutions Division have announced a marketing agreement that gives Mentalix rights to offer their UNIX software drivers for Agfa's Arcus and Arcus Plus, high-performance, low-cost color scanners. In addition, the agreement also makes Mentalix an authorized Agfa distributor and enables

### IMC's Data Manager

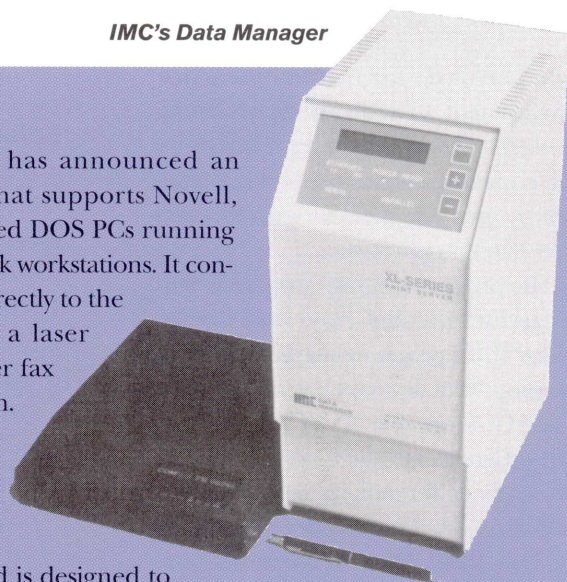
#### Print Server

IMC Data Manager has announced an Ethernet print server that supports Novell, TCP/IP UNIX, networked DOS PCs running XPRESS, and non-network workstations. It connects up to 18 printers directly to the network and can turn a laser printer into a plain-paper fax machine with a fax modem.

The XL-100E/IP Ethernet Print Server offers high-speed network printing to a wide range of applications and is designed to require no additional software, because built-in firmware interprets the supported protocols. Novell utilities, such as Pconsole, Capture, and Nprint, spool print jobs to the XL, which is set up as a Pserver and/or Rprinter. The XL is also an LPD server that supports standard UNIX systems, including HP-UX version 8.x for HP 9000 Series 300, 400, and 700 workstations (print files sent using LPR, RSH, FTP, or TFTP reportedly can find the XL anywhere on the Internet).

Direct peer-to-peer high-speed printing on the Ethernet is also available to DOS PCs loaded with XPRESS, a program designed to capture jobs directed to ports LPT1 through LPT4 and send them on the Ethernet to any selected printer on the XL. XPRESS requires no network operating system, and bypasses NOS printing facilities, if present. The basic XL-100E/IP features one Ethernet port and 10 I/O ports for connecting any combination of up to 10 printers, fax modems, and stand-alone workstations. Any type of printer/plotter can be connected and can be added to the network any time. Print files can be routed over the network from any file server to a specific printer attached to the XL, the company notes. Other built-in features include Auto Select for PostScript and PCL files, eight termination modes, and grouping of up to seven classes of printers.

The XL-100E/IP is the Ethernet model of the XL-100 Print Server. The basic XL-100 offers the same print server features with the exception of network protocol support. The XL-100 can be upgraded to the XL-110E/IP by adding the Ethernet card option. No resetting of parameters is required when the network has been brought down and back up again. Expansion options include 4 MB of memory and eight serial ports. The XL-100E/IP retails for \$995 and is available immediately. Contact IMC Data Manager, 4151 Business Center Drive, Fremont, California 94538, ph: (510) 770-8404 or (800) 537-5999.





the companies to offer bundled UNIX solutions, which include Pixel!FX imaging software and the Arcus Plus scanner. Mentalix will offer the bundled solutions through VARs to the electronic publishing and prepress, geographic information systems, CAD/CAM, and graphic arts markets worldwide.

The Arcus Plus is a flatbed CCD color scanner marketed by Agfa to users in the PC and Macintosh markets. Suggested U.S. pricing for the scanner is \$3,995 and \$1,000 for the Transparency Module.

Pixel!SCAN is available as a stand-alone application or as the front-end module in Pixel!FX for photographic image enhancement, retouch, and output. Pixel!SCAN serves as a UNIX interface to gray-scale and true-color scanners from a variety of manufacturers, and it allows users to prescan images to select specific areas of interest, interactively adjust intensity, contrast, and gamma settings, perform color calibration, and use both custom and linear lookup tables. Pixel!FX works with HP workstations and others.

The Arcus Plus is designed to provide 10-bit image sampling (RGB) and color image sampling of up to 1 billion colors. Scans can be made from both reflective (8-inch x 11 3/4-inch) and transparent originals (6-inch x 8-inch) at an optical resolution of 600 x 1,200 dpi. Multiple scanning modes allow users high-quality scanning for line art, halftone, continuous tone, and color images.

Contact Mentalix, 1700 Alma Drive, Suite 110, Plano, Texas 75075, ph: (214) 423-9377, fx: (214) 423-1145.

### Graph Development Tool

KL Group Inc. has announced the release of Version 2.3 of XRT/graph, designed to improve upon KL Group's two-dimensional graph widget toolkit

# Xfrm

## Motif in 5 Minutes

## GUI Builder

X programming without effort  
full featured screens  
realize x screens quickly  
motif was never so easy

The screenshot shows the Xfrm GUI Builder interface. It features a form with fields for Name (John Doe), Title (System Manager), Company (Big Products, Inc.), Phone (201-427-9292), Address (1234 Main Street), City (Anywhere), State (NJ), and Zip Code (01234-5678). Below these fields are sections for Product selection (Xfrm, MFORM, QREPORT, etc.), System selection (HP-UX, RTE, etc.), and Date/Reference information. At the bottom, there are buttons for Add, Next, Previous, Remove, Help, and Exit.

*Add X to your applications effortlessly  
Performs X11 and Motif calls for you  
Increases programmer productivity  
Dramatically cuts development time*

- No X programming knowledge required
- High level routines manipulate field's data
- Define forms with any UNIX text editor

**Combs International, Inc.**  
886 Belmont Avenue, Suite 3  
North Haledon, NJ 07508-2564

Phone: (201) 427-9292  
Fax: (201) 427-3428  
Internet: rcc@combsint.attmail.com  
CompuServe: 73042, 1711

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for X Window System developers. XRT/graph is designed to enable developers to embed bar charts, X-Y plots, pie charts, area graphs, financial graphs, or scientific charts into their applications.

The product is designed to add new data quickly without repainting the entire graph; automatically generate labels for the X-axis in seconds, minutes, hours, days, weeks, months, or years; and support 2-byte fonts such as Kanji and ANSI and POSIX locale standards. Rotated annotation and text is also possible with Version 2.3, although it is not directly supported by the X Window System. Vertical rotations of 90 degrees on the Y and Y2-axis are possible.

XRT/graph uses the same object-oriented API as the X Window System toolkit. XRT widgets can be used with all of the leading GUI development tools including BX, DevGuide, iXBUILD,

TelUSE, UIM/X and XFaceMaker. XRT/graph is available for Motif, XView and OLIT. XRT/graph 2.3 is published on the XRT Product CD, which contains all XRT widgets for eight different UNIX architectures, including HP 9000 Series 300, 400, 700, and 800. An XRT/graph development license lists at \$1,995 U.S. There are no royalties or run-time fees for distributing end-user applications built with XRT/graph.

Contact KL Group Inc., 134 Adelaide St. East, Suite 204, Toronto, Ontario, Canada M5C 1K9, ph: (416) 594-1026, fx: (416) 594-1919.

### COBOL Report Writer

Liant Software Corporation has introduced RM/COMPANION 2.0, a report writer for Liant's RM/COBOL environment, with a new WYSIWYG editor.

RM/COMPANION 2.0 is designed



## Sort/Merge Software

Information Resources, Inc. (IRI) is now shipping Version 3.0 of its sort/merge software, COSORT. The product's new BlockSize tuning parameter is designed to allow users to assign very large record blocks for sorting. Users can set an optimal number of bytes per physical read and write for each sort execution. The resulting throughput improvement over Version 2.5 is, on average, between 15 and 25 percent, the company notes. According to IRI, performance improves dramatically with larger data volumes.

The mainframe sort interface to COSORT 3.0, called SORTCL (for SORT Control Language), has an expanded command set to include record header and trailer labeling, multiple format input and output files, and field summing. COSORT 3.0 file names follow ISO 9660 conventions, and industry branding/compatibility-certification tests are in progress.

COSORT was the first third-party sort/merge package designed for UNIX data processing and application development, the company notes. The product includes three stand-alone utilities for end-user operations and can be called for programs written in C, COBOL, and FORTRAN. It permits all sizes and types of data files, including ASCII, EBCDIC, and MF and RM COBOL binary forms. Records can be fixed or variable length to 32,768 bytes, and any number of sort keys can be defined in stable or floating fields. COSORT is designed to impose no limits on input, compare, or output criteria and to reduce I/O through simultaneous, in-memory record exchanges with the application (calling) program.

COSORT 3.0 is available on HP 9000 Series 700 and 800 and other UNIX-based hardware, with configuration-dependent license fees starting at \$990.

Contact Information Resources, Inc., 319 Decker Road, M/S RR1, Craryville, New York 12521, ph: (518) 851-2815, fx: (518) 851-9822, e-mail: cosort@iri.com.

to bring 4GL-like reporting and writing capabilities to RM/COBOL file systems. Developers and non-technical users can quickly and easily query and print reports by manipulating fields and functions on a WYSIWYG screen, the company notes. For more sophisticated reporting, RM/COMPANION also features an improved programming language for sorting, selecting, calculating, and formatting reports.

RM/COMPANION 2.0 is distinguished from competitive report writers by its tight integration with COBOL data files. Because it uses the native COBOL file system, RM/COMPANION runs faster and with lower overhead than competitive report writers not based on COBOL, the company notes. RM/COMPANION also provides the option of generating reports in either compiled or interpretive modes. The software can be integrated

with Liant's RM/ GRAFS to display data on screen or print from an RM/COBOL application in graphical format, which allows users to generate graphical reports in addition to the standard tabular style RM/COMPANION reports.

RM/COMPANION Release 2.0 is available immediately and list prices begin at \$700. RM/COMPANION runs on every platform supported by RM/COBOL: DOS, OS/2, HP 9000 Series 300 and 800, and other UNIX systems.

Contact Liant Software Corporation, 959 Concord St., Framingham, Massachusetts 01701-4613, ph: (508) 872-8700, fx: (508) 626-2221.

## CA-UNICENTER Offer

For a limited time, authorized Computer Associates Resellers can offer their clients 120 days of free CA-UNICENTER for UNIX with selected Hewlett-Packard 9000 Series 800 computer systems purchased from Arrow's Commercial Systems Group. This offer results from an agreement between Computer Associates International,

Inc. and Arrow Electronics, Inc. Commercial Systems Group, whereby Arrow is designated a full-line distributor for CA-UNICENTER.

CA-UNICENTER is a comprehensive systems management tool for use on HP-UX and other UNIX platforms and on Microsoft Windows NT, Novell Netware, and IBM OS/2. The product is Computer Associates's premier solution for managing enterprise-wide mission-crit-



ical applications.

In addition, Computer Associates is offering free CA-UNICENTER introductory seminars to resellers nationwide. Resellers can obtain more information on the seminars and ask for a free demonstration disk by calling Computer Associates at (800) CALL-CAI or (516) 342-5224 and asking for the CA Business Partner Program.

### Technical Documentation Generator

Diamond Optimum Systems, Inc. has announced a UNIX version of DOCUMENTATION/3000. The HP-UX version is called DOC-UX and runs on all series of the HP 9000 mini-computers and HP 700 workstations.

DOC-UX is designed to automatically generate comprehensive technical documentation by analyzing source code written in any third- and fourth-generation language. The documentation is stored in a database, is automatically updated on a regular basis, and can be easily accessed via an online cross-reference module, the company notes.

Contact Diamond Optimum Systems, 22801 Ventura Blvd., Suite 211, Woodland Hills, California 91364, ph: (818) 224-2010, fx: (818) 224-2009.

### Cognos Business Alliances

Cognos Incorporated has announced collaborative business alliances with Sybase, Informix, Oracle, and Ingres. Cognos views these alliances as strategic steps in furthering the company's commitment to providing the best possible support for the open, client-server application development market. Under the terms of the alliances, Cognos can participate in Informix, Oracle, and Ingres's beta testing programs and partner in joint

marketing activities that include technical fairs and seminars. Cognos will also benefit from preferred terms on software license, support, and training. Cognos's Desktop marketing group markets client-server tools for bringing corporate information to the desktop. Cognos develops, markets, and supports open tools for developing business applications on a wide range of UNIX and proprietary midrange servers and supports desktop clients under Microsoft Windows.

Contact Cognos, 67 S. Bedford St., Burlington, Massachusetts 01803, ph: (617) 229-6600.

### Software Configuration Management

CaseWare, Inc. has announced Release 3.1 of CaseWare/CM, its Software Configuration Management (SCM) system designed to manage the software development and maintenance process. CaseWare/CM is currently available on HP 9000 Series 300, 400, 700, and 800 under HP-UX 8.0 and 9.0 and on other UNIX platforms.

Release 3.1 features significant performance enhancements over Release 3.0.1, averaging a 50-percent reduction in execution time with some functions reduced by as much as 80 to 90 percent, the company notes. *Developer's Task Reference* and *Introduction to CM and Methodology* have also been added to the documentation set. *Developer's Task Reference* is a self-contained how-to guide that focuses on the configuration management tasks typically performed by software developers.

The Base Model of CaseWare/CM, which provides an off-the-shelf definition of the SCM process, has been enhanced to improve support for large teams and sharing of changes in progress

among team members. A new merge capability supports the most common merge tools.

The product is designed to fully support heterogeneous computing environments, tool integration, and parallel, distributed, cross-target, and remote builds. It also is designed to provide true object-oriented facilities for management of all project components, versions and configurations, releases and variants, component life cycles, and system builds. Standard process life-cycle models, provided for immediate use, are customizable to implement customer-specified processes.

CaseWare/PT is an optional package designed to provide problem tracking and task management facilities integrated with the SCM functions of CaseWare/CM.

Contact CaseWare, Inc., 108 Pacifica, Second Floor, Irvine, California 92718-3322, ph: (714) 453-2200, fx: (714) 453-2276.

### Workstations, X Terminals

Tryonics Incorporated has announced a \$15 million agreement with Samsung Electronics for the assembly and distribution of Samsung workstations and X terminals. Under the terms of the agreement, Tryonics is assembling Samsung workstations and X terminals at its Portsmouth, New Hampshire facility. The Samsung workstation products are built on the PA-RISC chip and the HP-UX operating system. The X terminals are built on AMD RISC chips and operate with most popular workstation operating systems. The X terminals offer the best X-Stone-per-dollar performance in the industry for both color and monochrome X terminals, the company notes.

Tryonics is distributing the products



under the Tryonics and the Samsung brand names. Tryonics has distribution rights in the United States, Canada, South America, Eastern and Western Europe, the Middle East, and Russia. Tryonics distributes its products through a network of resellers and dealers and to a select set of Fortune 100 end users.

The applications under HP-UX on 9000, Series 700 are supported on Samsung's workstations and X terminals. The products are available immediately.

Contact Rick Muse at Tryonics, 170 West Road, Portsmouth, New Hampshire 03801, ph: (603) 427-6050, or Sam King of Samsung Electronics, 1600 N.W. 167 Place, Beaverton, Oregon 97006, ph: (503) 645-9660.

### Memory Expansion

Cal-Logic has announced immediate availability of the CL-319 memory expansion board for all HP 9000 Model 319 computer systems and the CL-340 memory expansion board for HP 9000 Model 340 computers.

Each CL-319 memory board can be configured to hold either 0, 4, or 8 MB of memory. The CL-319 memory board is the first HP 9000 Model 319 memory product that can be upgraded by the user with common low-cost memory components, the company notes. Memory expansion is accomplished by the installation of additional standard 1-MB SIMMs. Single-unit pricing for the CL-319 is as follows: configured with 0 MB, \$300; configured with 4 MB, \$600; configured with 8 MB, \$900.

Each CL-340 memory board contains 4 MB of memory. Up to a total of four boards can be installed in a 340 CPU, providing a maximum of 16 MB of memory. Single-unit pricing for the CL-340 is \$350 each.

### Electronic Medical Record System

Alliance Technologies and HP have announced a joint marketing agreement under which Alliance's electronic medical-record systems will be ported to HP 9000 Series 700 and Series 800 systems.

According to Alliance, its core technology, TEXTMACHINE, is the first object-oriented, full-text database designed for a scalable client-server environment. It is designed to provide intelligent, rapid access to large (multi-gigabyte) patient and knowledge databases. TEXTMACHINE is designed to enable more flexible access to information and greater ease of use than traditional document-retrieval systems.

Alliance's EMRx is a text-based solution for building, managing, and accessing medical records. Its object-oriented data structure is designed to give users access to specific information within documents. An add-on module called MAVEN, scheduled for release in the third quarter of 1993, will provide online search access to key medical knowledge databases, journals, diagnostic and procedure codes, and customized databases.

Contact Alliance Technologies, Inc. Healthcare Systems Group, 6034 West Courtyard Drive, Suite 250, Austin, Texas 78730, ph: (800) 695-9857 or (512) 794-9856.

Each CL-319 and CL-340 memory board is tested for a 72-hour period prior to shipment and is covered by a lifetime warranty. A 30-day free trial program is available for both the CL-319 and CL-340. Contact Cal-Logic, 18707 Parthenia St., #3, Northridge, California 91324, ph: (818) 701-9005, fx: (818) 701-5572.

### Melillo to Resell SoftBench

Melillo Consulting, Inc. (MJM Software) has announced an agreement with HP to market the entire suite of HP CASE tools, featuring SoftBench and SoftBench/C++, for HP 9000 and Sun SPARC workstations.

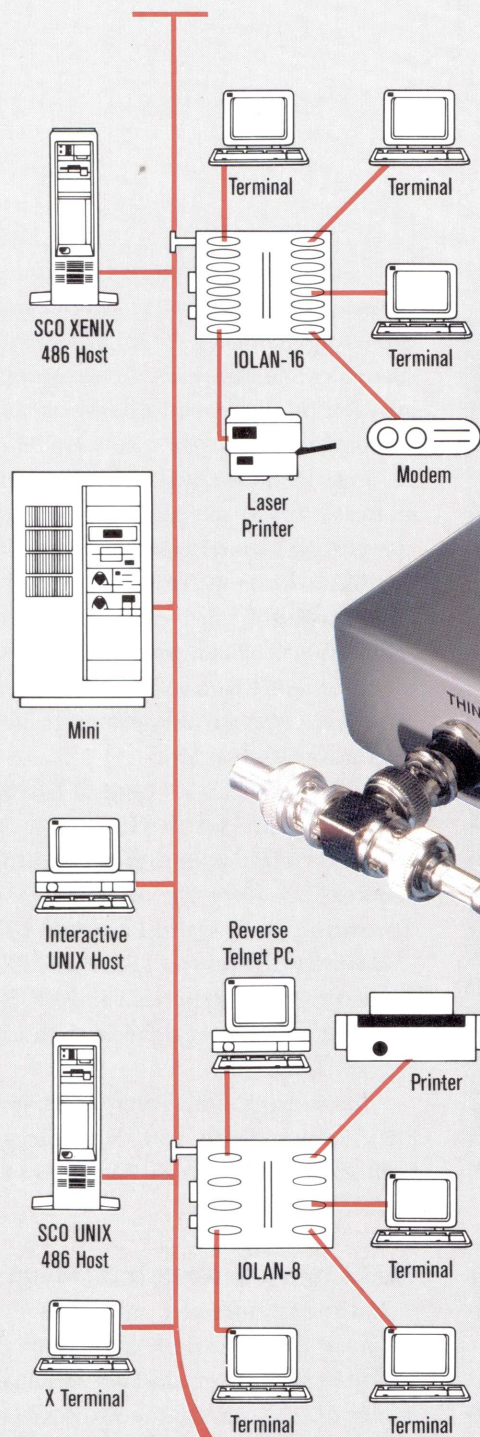
HP's SoftBench combines tools for software development with an open

architecture for integration of third-party CASE tools, allowing personalization to the user's methodologies and the project's demands. Unlike the vast majority of current CASE products on the market, SoftBench imposes no rigid structure on the developer. HP provides a backplane designed to permit easy integration of existing favorite tools into one unified framework.

Founded in 1988, Melillo Consulting, Inc. specializes in providing software tools and consulting services for application developers under the UNIX and DOS/Windows operating systems. The consulting staff is experienced in porting, team software development, networking, and engineering applications and office systems. The company is an HP hardware



# Finally a terminal server that won't retire before you.

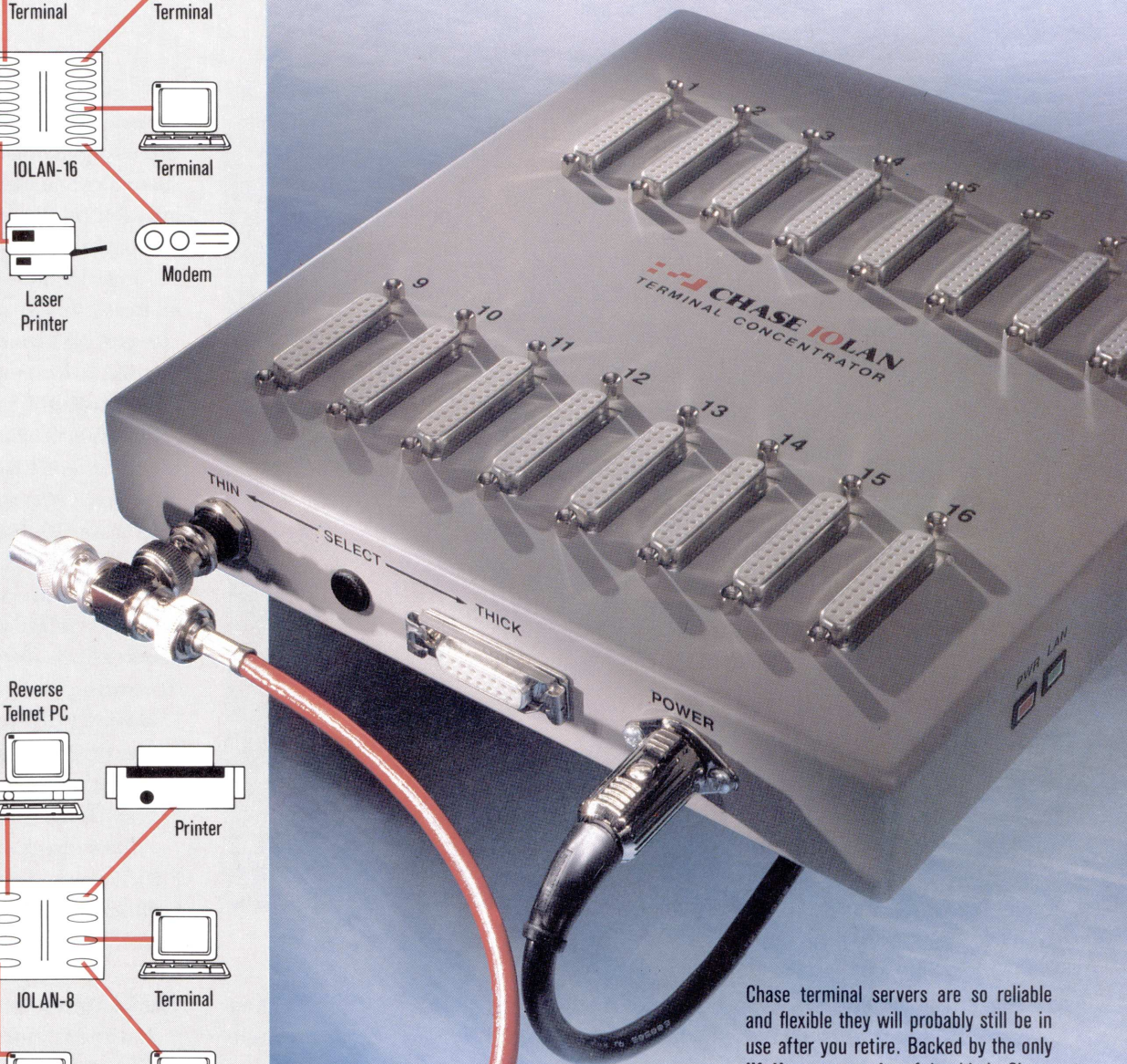


Typical IOLAN Network  
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## Compression Software

ASCENT SOLUTIONS Inc. (ASi) has begun shipping PKZIP and PKZIP Data Compression Library for HP 9000 Series 700 and 800 systems. A version for Series 300s and other UNIX platforms is also available.

PKSZIP MultiPlatform uses the advanced deflation algorithm, intended to allow fast operation while yielding compression ratios in excess of 90 percent.

The PKZIP Data Compression Library (DCL) is designed to allow software developers to incorporate data compression easily and seamlessly into their software application programs and to allow completely generic compression and extraction to and from any location on 14 different platforms. Data compressed on one system may be decompressed on another using the comparable library. All I/O is handled by the application routine, making the DCL extremely flexible. No run-time royalties are required. Prices for PKZIP range from \$119 for a single-user desktop version to \$1,950 for a multiple-user license. PKZIP will also be porting to the HP 3000.

In 1992 ASi obtained the rights from PKWARE to develop and market non-DOS PKZIP compression products. ASi manages the distribution and marketing of PKZIP MultiPlatform and the PKZIP Data Compression Library from its headquarters in Dayton, Ohio.

Contact ASCENT SOLUTIONS Inc., 17 South St. Clair, Suite 300, Dayton, Ohio 45402, ph: (513) 222-9012, fx: (513) 222-9011.

reseller, a full-service software development consulting firm, and an independent software vendor.

Contact Melillo Consulting, Inc., 17 Clyde Road, Suite 202, Somerset, New Jersey 08873, ph: (908) 873-0075, fx: (908) 873-2250.

## HP to Distribute Liken

Xcelerated Systems, Inc. (XSI) has announced Hewlett-Packard's plans to distribute XSI's Liken software throughout Europe on its HP 9000 Series 700 PA-RISC workstations. The software will be distributed through Hewlett-Packard's network of Local

Product Organization Offices (LPOs) established in every country throughout Europe.

Liken enables most standard Macintosh applications, as well as specialized software such as ChemDraw, Quickmail, and MeetingMaker, to run on Liken without modification. Liken provides access to the thousands of off-the-shelf Macintosh applications on the market, including many personal productivity and electronic mail tools.

Macintosh applications supported by Liken include Claris FileMaker Pro, MacProject, MacDraw, MacWrite, Microsoft Word, Excel, Powerpoint,

Aldus PageMaker, QuarkXpress, and Canvas. All run without modification, the company notes. Users are able to share files and databases, access software available on the Macintosh servers, and exchange mail via Microsoft Mail and CE Software Inc.'s Quickmail. Liken also enables users to take advantage of cost-effective NFS-mounted storage, including disk drives, tape drives, disk arrays, and CD-ROM, and print to Apple Laserwriter and compatible Postscript laser printers. Liken software was introduced in 1992, with a single-user license priced at (U.S. list) \$695.

In addition, XSI's "Taste of Liken" demo software will be included on LaserPro, HP's program promoting application software on CD-ROM. According to XSI, the LaserPro CD-ROM disk with "Taste of Liken" will ship with every HP 9000 Series 700 PA-RISC workstation sold worldwide through January 1994.

Contact Xcelerated Systems, 9245 Sky Park Court, Suite 130, San Diego, California 92123, ph: (619) 576-3080, e-mail: liken@xsi.com.

## Workstation, NetWare Integration

UniPress Software Inc. has announced the immediate availability of SoftNet, a software product line designed to allow UNIX workstations to become fully integrated Novell NetWare servers or clients. SoftNet requires no additional hardware or software, including PC-NFS or similar products. SoftNet, developed by Puzzle Systems, has three parts: SoftNet Utilities (the server), SoftNet Client, and SoftNet Term.

SoftNet Utilities allows Sun, HP, IBM, SGI, and SCO workstations to be Novell NetWare 2.2 or 3.1 servers, providing file and print sharing capabilities. No disk



partitioning is necessary, and NetWare client PCs map UNIX directories directly. The UNIX computer retains full functionality at all times, the company notes.

SoftNet also allows transparent file exchange between UNIX workstations and PCs while retaining all the security features of UNIX and NetWare. The UNIX system running SoftNet has the same interface and is administered the same way as an ordinary NetWare server, and administrative utilities like Novell's sys.con and fconsole are fully functional on the UNIX server. SoftNet Utilities also includes a DOS terminal emulator for access to the UNIX host with the IPX protocol.

SoftNet Client is designed to allow UNIX workstation users to mount NetWare servers to access files and use the NetWare disk and printing resources. SoftNet Client does not dedicate the UNIX machine to NetWare-only operation.

SoftNet Term allows a PC NetWare client to conduct a remote UNIX terminal session using IPX as a transport. No additional purchase of TCP/IP is required. The DOS terminal emulation is carried by the IPX protocol that has been established when both PC and UNIX components are running. The SoftNet Term host side requires no disk partitioning and can be used as a stand-alone product.

SoftNet Utilities is priced from \$1,299 for 16 concurrent NetWare connections. SoftNet Client is priced at \$399 for a single user and \$1,499 for a five-pack. SoftNet Term requires the purchase of both UNIX host and PC sides. Prices are \$399 per host for the UNIX side, and SoftNet Term for the PC is priced from \$99.

Contact UniPress Software, 2025 Lincoln Highway, Edison, New Jersey 08817, ph: (908) 287-2100, fx: (908) 287-4929.

## If Network Printing Problems Are Giving You Nightmares...



## You Need UNISPOOL!

**Networked printers can cause as many problems as they solve.**

That's why UNISPOOL was designed to meet your specific network printing problems. UNISPOOL offers solutions to problems associated with network environments where there are diverse applications, multiple printing resources and little room for error. UNISPOOL can manage your spoolfiles effectively, efficiently, and securely even in mixed computing environments.

UNISPOOL is installed on thousands of machines throughout the world and is used by 40% of America's Fortune 500 companies.

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Fax: +31 (4187) 3060



### Message Delivery System

HERMES Softlab has announced GRACE, a multiplatform message delivery system designed to guarantee secure and reliable message delivery between applications in heterogeneous enterprise-wide environments. Peer-to-peer transaction processing runs efficiently between application components. It is easy to use, yet provides a clear split between the application and the network code, the company notes.

GRACE is designed to significantly cut development costs of distributed client-server applications by completely hiding the complexity of the underlying network from the application programming. Thousands of lines of communications code can be replaced by simple GRACE API calls, according to the company.

The system's modular architecture allows use of TCP/IP, NCS, or DCE as the communication mechanism. Currently it supports HP-UX, SunOS, AIX, Solaris, and MPE/iX operating systems. GRACE is aggressively priced for enterprise networks as well as for software development.

Contact Hermes Softlab, ph: (+38) 61 558 493, fx: (+38) 61 558 473.

### Workload Management

Unison-Tymlabs has introduced Maestro for UNIX, reportedly the first industrial-strength workload management product for UNIX systems. Maestro for UNIX is designed to enable systems managers to schedule jobs anywhere on the network, according to customized business calendars.

With the announcement of Maestro for UNIX, Unison-Tymlabs has achieved cross-platform portability across the HP MPE and HP-UX platforms. Maestro has been available to users of HP's MPE operating system since 1986.

Maestro for UNIX is designed to automate network job scheduling, tracking, and monitoring to increase throughput and reduce processing errors. Maestro's client-server architecture also provides

control of user access and production activities on remote clients.

Maestro also is designed to control all client systems on the network from a single management console, schedule and launch jobs, limit the number of jobs executing simultaneously, integrate jobs submitted with "at" and "batch" commands, enforce job dependencies and control across systems and platforms, provide real-time job tracking displays, keep a detailed record of job execution, provide a comprehensive audit trail, log statistics for complete reporting and analysis, document job completion status, automate recovery procedures, and ensure job processing integrity through fault-tolerant workload distribution.

Maestro for UNIX is available immediately

on the HP-UX platform and is priced starting at \$4,960. Contact Unison-Tymlabs, ph: (408) 245-3000.

### Network-Ready UPS

Network Security Systems, Inc. (NSSI) has introduced NET-UPS, designed to provide dependable and ready-to-use network power backup and management solutions in Novell or UNIX environments. Each NSSI NET-UPS is designed to give system administrators everything they need to set up a complete network power system: intelligent uninterruptible power supply (IPS/A.I. 450 VA, 600 VA, 800 VA, or 1,200 VA), RS-232 serial cable for bi-directional communication across the network, and network power management software (LanSafe II)—all at a reduced price.

Using the NET-UPS combination of network power products, administrators can troubleshoot power problems and monitor real-time loads, battery, and voltage status. Pull-down menus provide the ability to change power and program settings instantly, conduct networkwide tests, reboot or shut down any protected network device, and view historical power event logs.

If a prolonged power outage occurs, the system will begin an orderly shutdown of the Novell or UNIX network for quick restoration of the system when power returns, the company notes. Automatic daily hardware testing and software-controlled battery preventive maintenance procedures are designed to provide increased system life and reliability.

According to NSSI, the following are exclusive power management features: simultaneous power management of all network devices with an attached NSSI UPS, remote control of hardware



through LAN or WAN connections, instant software-controlled hardware configuration changes (no more dip switches or on-site technical personnel needed), and a "brownout regulator" for remote and instant selection of upper and lower voltage limits for UPS transfer to battery.

The NET-UPS product line is available now. The U.S. list prices are as follows: NET-UPS, 450-Novell, \$549; NET-UPS, 600-Novell, \$699; NET-UPS, 800-Novell, \$899; NET-UPS, 1200-Novell, \$1,299; NET-UPS, 450-UNIX, \$562; NET-UPS, 600-UNIX, \$710; NET-UPS, 800-UNIX, \$910; NET-UPS, 1200-UNIX, \$1,310.

NSSI products support Novell, Windows, OS/2, LAN Manager, LAN Server and HP 9000 Series 700 with the HP-UX 8.0.7 and up. Other UNIX platforms are supported as well. NSSI's entire line of products is backed by a full, two-year warranty. Contact NSSI, 9401 Waples St., San Diego, CA 92121, ph: (619) 587-7950 or (800) 755-7078, fx: (619) 552-9162.

### PC Client-Server Backup

ORBiT Software has announced its representation of Plan-B, unattended client-server backup for networked PCs and servers to an HP 3000 or HP 9000 host computer.

With Plan-B, PC data is backed up to HP 3000 or HP 9000 disk files, which are then stored with the normal host system backup. This is designed to provide consistency and data integrity between the PC clients, PC network server, and HP 3000 or HP 9000 host. Alternately, PCs may be backed up through the host directly to tape.

Backups are initiated automatically by the HP 3000 or HP 9000 without user intervention; restores are initiated by the

PC user. This eliminates or minimizes operator intervention for backup and restore, and guarantees that PCs are backed up on a regular basis, the company notes.

ORBiT Software, the makers of

BACKUP/3000, will be working closely with System Consultants in Southern California to provide the product to HP 3000 and HP 9000 users. ORBiT also represents Quest Software's MPE and HP-UX software products in Europe.

### Lantronix's Local Network Interconnect product

#### Ethernet Devices

Lantronix has announced three Local Network Interconnect (LNI) products that can either enable up to eight devices to share a single Ethernet network connection or allow the devices to form their own network.



When used with existing nets, the products allow up to eight nodes to be connected through a single tap, or transceiver—making the connections simpler and saving on the cost of up to seven transceivers. The three models announced (LPM2, LPM4, AND LPM8) have two, four, or eight ports for external devices and one for connection to the network. Both the network and node ports use IEEE 802.3 compliant AUI interfaces.

LPMs also function in a stand-alone mode for setting up two-, four-, or eight-node local networks. In this mode, they replace up to eight transceivers and the coax segment that would be used to interconnect them, and require no external power supply.

Features include:

- Jabber protection on each node port to prevent a problem node from disrupting the entire network
- Selectable Heartbeat function for stand-alone use
- Separate jabber and receive LEDs for each node port
- Power, collision, and OK LEDs to show unit status

The three LPM models are priced at \$325, \$425, and \$595, in unit quantities, and are available off the shelf.

Contact Lantronix, 26072 Merit Circle, Suite 113, Laguna Hills, California 92653, ph: (714) 367-0050 or (800) 422-7022, fx: (714) 367-0287.



### Cross-Reference utility

Productive Software Systems, Inc. has announced ROBOT/UX, a source code cross-reference utility for HP 9000 systems. This productivity tool cross-references source code on one or a network of HP 9000s. Keyword searching is fast and easy, setup is as simple as defining the filesets to be indexed, and files are scanned and indexed automatically whenever they change, the company notes. ROBOT/UX provides support for almost all third- and fourth-generation languages and can work with HP's SoftBench environment.

Introductory prices start at \$895 and are being offered through December 31, 1993.

Contact Productive Software Systems, Inc., 5810 West 78th St., Minneapolis, Minnesota 55439, ph: (800) 726-4099 or (612) 831-8866, fx: (612) 831-3293.

Plan-B pricing ranges from \$2,750 to \$13,500. Contact ORBiT Software, 315 Diablo Road, Danville, California 94526, ph: (510) 837-4143, fx: (510) 837-5752.

### UniKix Achieves Mainframe Dimensions

Integris has announced UniKix Release 4.0, which includes extended scalability on symmetrical multiprocessor (SMP) UNIX systems, leading mainframe-integration functionality, and new mainframe-class system administration and batch capabilities.

UniKix is a transaction processing monitor implemented on open systems that supports the IBM CICS-API and provides functionality to port IBM CICS/COBOL/VSAM and DB2 appli-

cations to UNIX. These capabilities provide major cost reduction benefits as well as investment protection of mission-critical mainframe production applications and data, 3270 terminal, and SNA network integration, and utilization of CICS programmer and end-user skills that exist in thousands of MIS organizations today.

The architecture of UniKix has been extended in this release to include optimized algorithms for efficient processing of a large number of production transactions on very large UNIX systems.

In addition, the UniKix implementation of VSAM on UNIX has been enhanced in Release 4.0 to support a VSAM file size of up to 16 GM, and support for the standard Sybase relational DBMS has been added. UniKix now supports CICS transaction processing using the leading Oracle, Informix, and Sybase RDBMS products on UNIX.

The new also features enhancements for intersystem communications and use of SNA LU6.2 protocols with UniKix.

New systems administration features have also been added. KixWorld is designed to provide a single control point for all system management functions on one or more UNIX systems. KixWorld provides a single system-level interface to launch administrative facilities such as multiple UniKix systems,

batch management facilities, system performance monitors, RDBMS systems, and security systems. KixWorld provides graphical user interfaces to all of these system management functions using X/Motif. New third-party administration products will be integrated with these UniKix capabilities, the company said.

The KixScan and UniKix monitor product is integrated with these new features and is also being enhanced to monitor multiple UniKix systems on one terminal screen. Other administration features added to UniKix include accounting, billing, and capacity planning features that can be integrated with leading products, such as SAS from the SAS Institute, Inc., for reporting.

New extended Batch Facility option associated with UniKix R4.0 contains an automated IBM MVS JCL conversion product, and job management and control features to provide batch capabilities on UNIX similar to the mainframe.

UniKix R4.0 general shipment is planned for Fall 1993. Pricing for UniKix R4.0 starts at \$1,000 per concurrent user. Contact Integris, 302 Concord Road, Billerica, Massachusetts 01821-4191, ph: (508) 294-7900, fx: (508) 294-7901.

### Optical Drives and Libraries

Concorde Technologies has announced new high-performance optical drives that reportedly set new standards for capacity, performance, and price. These new multifunction (rewritable or WORM media) optical drives are designed to offer density and performance capabilities that approach those of hard disks—1.3 GB of storage per optical cartridge, 14.3 ms effective access time, 23.5 ms average seek, and 8.3 ms latency.

All models include a SCSI interface and provide support for all major UNIX



computer platforms and operating systems, including HP 9000 systems. The optical library versions include from one to four optical drives along with robotics for swapping optical media. All of the models incorporate a 3600/2400 rpm optical mechanism and support all major optical industrial standards, the company notes. The units also provide support for the older 650-MB optical cartridges. On-site maintenance service is available for all models in addition to the standard one-year warranty.

The stand-alone Model HPO1300S offers 1.3 GB of formatted capacity (650 MB X 2 sides) via either a rewritable or write-once (WORM) cartridges. This unit is available in either a table-top enclosure or in an internally mountable configuration. Model HPO1300S starts at \$3,695.

The Model HPO020LT offers 20.8 GB capacity using 16 1.3-GB, 5.25-inch rewritable or write-once disks. This unit includes one optical drive mechanism, the robotics for the optical cartridges, and a single-ended SCSI interface, with a differential SCSI interface available. The unit is packaged in a desktop cabinet with a list price of \$12,995.

The Model HPO040T is a 41.6-GB optical library system with the capacity for 32 1.3-GB optical cartridges. The Model HPO040T has dual 5.25-inch optical drives and the robotic mechanism to handle the 32 cartridges. A single-ended SCSI interface is standard and a differential SCSI interface is optional. The



Concord's Optical Drives

standard unit comes in a desktop cabinet, with a list price of \$24,995, and a rack-mountable version is also available.

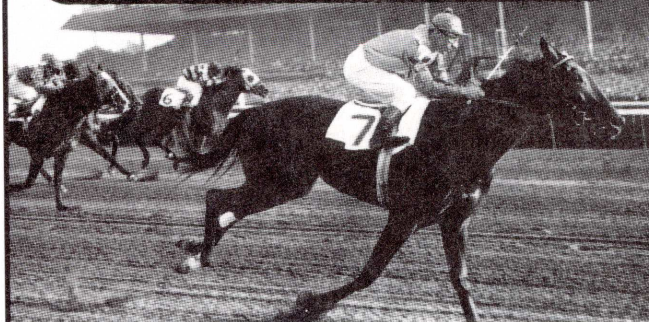
The Model HPO120T offers a capacity of up to 114.4 GB of storage with 88 1.3-GB optical cartridges. The Model HPO120T is available with either two or four optical drive mechanisms. Like the other members of the family, the drive offers an 80,000-hour MTBF (mean-time-between-failure) and the robotics are specified at over 1 million MSBF (mean-swaps-between-failure). The Model HOP120T may also be upgraded to the

HPO200T 187.2-GB model. The HPO120T is a floor-standing system that may be ordered with either single-ended or differential SCSI interface. The two-drive version lists for \$49,995, while the four-drive version lists at \$58,995.

The Model HOP200T offers 187.2 GB of available storage capacity using 144 rewritable or write-once optical cartridges. The floor-standing system also offers a choice of either two- or four-drive configurations and either single-ended or differential interface. The two-drive version lists for \$66,995 and the four-drive version lists for \$75,995.

Contact Concorde Technologies, 7966 Arjons Drive, Suite B-210, San Diego, California 92126, ph: (619) 578-8750 or (800) 359-0282, fx: (619) 578-3188.

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### Reflection X

Walker Richer & Quinn (WRQ) has announced Reflection X, designed to give PCs access to applications distributed across the enterprise network.

The new 32-bit PCX server is designed to provide fast X performance and give users the additional advantage of integrating heterogeneous platforms on the Microsoft Windows desktop; a PC user can run HPVUE for the HP 9000 and copy and paste between it and Microsoft Windows.

The product will be sold stand-alone or bundled with WRQ's own TCP/IP stack and with Reflection 2 for Windows. Reflection FTP, which managed FTP file transfers through the familiar Microsoft Windows interface, is part of both the stand-alone and bundled packages.

Other Reflection X features include X11R5 compliance, support for all major X GUI standards (Motif, OpenLook, etc.), support for scalable fonts and the font server, support for all major third-party TCP/IP products, X trace utility, and Window socket support.

Reflection X requires an 386 or 486 IBM PC-AT, PS/2 or compatible, with a minimum of 4-MB RAM and a network interface card. Software requirements include MS-DOS 3.1 or higher, Microsoft Windows 3.1, and supported TCP/IP software.

Single copy retail price of Reflection X is \$469; with WRQ's TCP and Reflection 2, the price is \$599.

Contact Walker Richer & Quinn, 2815 Eastlake Ave. E., Seattle, Washington 98102, ph: (800) 872-2829 or (206) 726-7219.

configuration averages \$6,000 per concurrent user, including all ClearSupport functionality and the ClearSupport Diagnosis Engine. ClearQuality averages \$4,000 per concurrent user, including all ClearQuality functionality and interfaces to the ClearSupport system. An Oracle runtime license is available from Clarify. Pricing is dependent on the type of server and the number of users on the system.

Contact Clarify, 2702 Orchard Parkway, San Jose, California 95134, ph: (408) 428-2000, fx: (408) 428-0633.

### HP and Epoch Agreement

Epoch Systems has announced an agreement with HP, which enables HP to provide its customers with Epoch's network backup and file migration software on the HP Series 9000. The two companies will work together to port EpochServ, EpochBackup, and EpochMigration software to HP's Series 700 and 800 systems. Epoch and HP plan to jointly market the new solutions.

EpochServ is the platform on which client-based applications, EpochMigration and EpochBackup, provide enterprise-wide file migration and backup and recovery. EpochBackup software automatically backs up and restores client files located throughout the enterprise in heterogeneous environments, on a variety of platforms, to an EpochServ-based server.

EpochMigration software is designed to provide automated, enterprise-wide migration of client files located in heterogeneous environments, on a variety of platforms, to an EpochServ-based server. The software is designed to automatically and transparently migrate inactive data from the client's magnetic disks to a server's magnetic disks and,

### Customer Service Management

Clarify has announced that its Customer Service Management (CSM) system now supports both the Oracle relational database and the HP 9000 servers and workstations.

The Clarify CSM system is comprised of ClearSupport, the technical support management system; ClearQuality, the defect tracking system; and ClearLogistics, the field service inventory management system. They are designed for use in systems and software companies that often have hundreds of engineers, thousands of customer calls per day, and

millions of dollars worth of field service inventory.

Clarify products are client-server-based and run native on the most popular desktop computers: PCs running Microsoft Windows, the Macintosh system, and UNIX with the Motif graphical user interface. The UNIX machines supported include Sun, Silicon Graphics, and HP. Clarify currently supports both Sybase and Oracle relational database management systems.

ClearSupport and ClearQuality, supporting Oracle or HP 9000, are available immediately. A typical ClearSupport



ultimately, to optical and tape libraries.

Contact Andrew Hettinger, Epoch Systems, (508) 836-4300.

### StorageTek Acquires Scepter Corporation

Storage Technology Corporation has acquired Sceptre Corporation, supplier of software to manage cartridge-tape information storage in open-systems computing environments. Terms of the transaction were not disclosed.

Sceptre, which is based in Ann Arbor, Michigan, is privately held. Sceptre is known in technically oriented environments where supercomputers and UNIX workstations are found, and StorageTek sees a bright future for its products in general-purpose computing. The company plans to add resources at Sceptre and maintain it as a separate business. Sceptre's information-storage management products include REELlibrarian, REELbackup, and REELexchange.

Contact Storage Technology Corporation, 2270 South 88th St., Louisville, Colorado 80028-0001, ph: (303) 673-5151.

### Novell Capabilities for Interface Cards

XCd Inc. has announced Novell NetWare protocol capabilities for its XJet III and XJet IV family of multiprotocol Ethernet interface cards for HP printers. At the same time, the company announced that the XJet IV cards are now supported in HP's new LaserJet 4Si, a 17 page-per-minute, 600-dpi network printer.

The XJet cards now support the Local Area Transport (LAT) protocol, the Transmission Control Protocol/Internet Protocol (TCP/IP), as well as the NetWare protocol. This means that DEC, UNIX, and Novell computers can all simultaneously queue jobs to an HP

printer equipped with an XJet card. This printer can concurrently support up to five protocols (LAT, TCP/IP, LAN Manager, NetWare, and AppleTalk).

When running in NetWare mode, the XJet acts as a NetWare print server with encrypted password support, eliminating the need for an intermediate print server. The XJet can be configured and managed using the standard Novell PCONSOLE program and is compatible with the NetWare 2.xx and 3.xx network operating systems. NetWare 4.0 support is planned in the future.

The XJet IV is a card that plugs into the modular I/O (MIO) slot in the HP LaserJet IIISi, 4Si, and 4, as well as in the DesignJet plotter and the PaintJet XL300 and DeskJet 1200C color printers. It is available in versions with standard Ethernet and thin Ethernet connectors, or with a 10baseT unshielded twisted pair connector. The XJet III plugs into the Expanded I/O (XIO) slot on the LaserJet II, IID, III, and IIID printers, and is available in thin or 10baseT versions.

The XJet IV and XJet III are priced at \$695 with all three protocols and are available immediately.

Contact XCd, 2172 Dupont Drive #10, Irvine, California 92715, ph: (714) 476-7855, fx: (714) 752-0609.

### New from HP

#### HP Reduces Prices of HP 700/RX Stations

Hewlett-Packard Company has reduced prices of products in its market-leading HP 700/RX station family by up to 35 percent, or \$1,000.

The price cuts are designed to broaden the appeal of X stations to a larger customer base, although HP is already the worldwide revenue leader for X sta-

tions and the leading worldwide supplier of color X stations, according to X Business Group, a market research firm.

HP 700/RX station price reduction are as follows:

Model Specifications		Old U.S. Price	New U.S. Price
15Ci	15-inch color	\$2,995	\$2,495
14Ci	14-inch color	\$2,495	\$1,995
Mi	mono base unit	\$2,695	\$1,895
Ci	color base unit	\$2,895	\$1,895

The Model 15Ci and 14Ci X stations are ideally suited for word processing, presentation graphics, inventory management, patient monitoring, and general business applications. The systems support up to 18 MB of RAM and up to 16.7 million colors.

#### Enhanced Messaging

HP has announced a new release of OpenMail, which has been integrated with OpenView, the industry-standard network and system management platform. The latest release features new management capabilities, additional clients of choice, new mail-enabled applications, and additional gateways.

HP OpenMail now includes the following:

- Support for Lotus cc:Mail as a direct client
- Support for Microsoft Mail as a direct client
- HP client for Macintosh and Sun users
- HP Phonebook support for Windows, Macintosh, and Motif users
- OpenMail Bulletin Board
- OpenMail integration with HP OpenView
- PROFS migration



- People Mover
- Directory synchronization

New functionality for HP X.400 includes X.400 integration with OpenView and the X/Open-APIA Gateway API.

A core component of HP's X.400 UNIX system-based solution is the HP OpenMail server and infrastructure. Now, directory synchronization services are designed to synchronize OpenMail directories and non-OpenMail directories, including SoftSwitch Central. The system's People Mover utilities are designed to allow administrators to move OpenMail users and their data between distributed nodes in the network.

The integration with OpenView allows network managers to monitor distributed OpenMail servers and networking and system processes from a single graphical workstation. Network managers now will be able to monitor message queues, disk usage for storing messages, and gateway usage, as well as track undelivered messages across the network and obtain accounting/billing reports of mail usage. Additional features are designed to let OpenView managers provide remote notification via beeper or printer, enable or disable logging, and be notified of potential security breaches, such as use of invalid passwords.

HP is also providing migration services to IBM PROFS users, who are using a product IBM no longer supports. IBM OfficeVision/VM users can also migrate to HP's open systems backbone infrastructure.

New electronic-mail user agents have been designated "Clients of Choice" for the HP OpenMail server and messaging infrastructure. HP

OpenMail now includes drivers for cc:Mail and Microsoft Mail clients from Lotus Development Corporation and Microsoft Corporation, respectively. The need for gateways, directory synchronization, and PC server post offices is eliminated, HP notes.

The new version also contains interfaces for the Apple Macintosh, SUNsparc Solaris, and new versions of its existing interfaces for Windows and NewWave. The new HP Windows client offers an iconic graphical interface and includes access to a Bulletin Board, and the latest NewWave Mail release provides acknowledgments and auto-actions, such as auto-forward and auto-reply.

HP also announced the availability of a Phonebook application, designed to allow easy look-up access to configurable fields on the rich OpenMail directory. The Phonebook application is available for Windows, Macintosh, and OSF/Motif desktops and can be used in conjunction with any of the "Clients of Choice."

HP also announced a joint marketing, development, and support agreement with The Boston Software Works as a gateway supplier for the HP Electronic Messaging Solution. BSW's new

InterOFFICE gateways for HP OpenMail and PROFS/OfficeVision/VM support coexistence during PROFS or OfficeVision/VM migrations and also provide interoperability between OpenMail and/or HP X.400 to many other office systems.

HP's messaging system is designed to provide connections to other host systems, LAN-based HP OpenMail and HP Document Manager.

The user-based pricing of HP OpenMail has been reduced. A mailbox and client license is now \$145 per user for 1 to 99 users, and the price-per-user reduces even further as more users are added to the system.

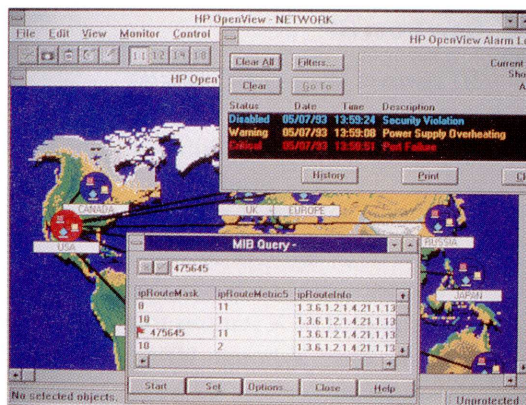
### *OpenView for Windows 7.0 and 7.1*

HP has announced the HP OpenView for Windows network and system management software platform Versions 7.0 and 7.1. New features include an enhanced user interface, a new alarm manager, auto discovery and auto layout of TCP/IP and Novell IPX networks, an SNMP manager, and an application builder. The new software has a consistent look and similar features with the UNIX-based HP OpenView SNMP platform.

HP OpenView for Windows 7.0 supports Windows 3.1 style guidelines, status and tool bars, and simplified application registration. Version 7.0 also supports the simultaneous display of multiple network submaps for viewing different portions of a network at the same time.

New features in 7.0 include an alarm manager for alarm filtering, sorting, and history reporting; device icons that change color to one of 10 alarm states; alarm configuration for paging a remote location, playing

**HP's OpenView**





*Interex Contributed  
Software Library Update*

## 1993 HP-UX CSL Released by Interex

The 1993 Interex HP-UX CSL was released on June 1. The new release contains utilities and applications that have been created by experienced administrators to target the specific challenges HP-UX users face. This year's release contains 53 of the most current and effective programs, many of which come directly from Hewlett-Packard Labs.

The release features:

- **c-news**, the basic software needed to set up a server node to participate in USENET, a global electronic conferencing system.
- **wscrawl**, an X-window paint program that can be shared by a number of people at the same time. This is a great tool for collaborative work groups.
- **f2c**, a fortran to C translation tool. This program has many options to handle specific language constructs and will also produce both ANSI C and K&R style C.
- **tripwire**, a file integrity checker. This utility compares a designated set of files against information stored in a previously generated database.

HP-UX users who subscribe to Interex CSL-level membership automatically receive the annual release in addition to publications, conference discounts, and other benefits. Additional releases are available to CSL-level members for \$400.

*Call (800) Interex or  
(408) 747-0227 for more  
information.*

*The International Association of  
Hewlett-Packard Computer Users*

**INTEREX**

## Interex is your HP-UX advocate

**ad • vo • cate:** to plead in favor of, *see support*

HP-UX users can rely on Interex, a 7,500-strong membership organization, as a powerful channel to Hewlett-Packard. Interex is committed to supporting HP-UX users through volunteer committees and special interest groups:

**SIGUNIX**—The Special Interest Group for UNIX, meets at the annual Interex HP Computer Users Conference to discuss areas of concern unique to HP-UX users and to share solutions.

### Systems Improvement

**Committee/HP-UX**—The SIC HP-UX pinpoints specific user needs for the HP-UX operating system and presents its requests for system upgrades, etc. to Hewlett-Packard.

### Advocacy Coordinating

**Committee**—The Advocacy Coordinating Committee facilitates communication between HP-UX users and Hewlett-Packard, enabling users to have specific concerns referred directly to the accountable HP entity. This committee tracks and manages all advocacy requests and publicly discloses the outcome of all advocacy issues.

**INTEREX**

*The International Association of  
Hewlett-Packard Computer Users*

an audible sound file, or sending an electronic-mail notification; and IPX protocol and Windows Sockets Interface support. Further enhancements to Version 7.0 are designed to allow the software to run faster and support larger networks on its network map.

In August 1993, HP OpenView for Windows will feature customizable auto-discovery and layout, the ability to develop simple SNMP management applications, and a development tool for HP OpenView for Windows applications. HP OpenView for Windows 7.0 and 7.1 have a similar user interface and a common feature set with the HP OpenView SNMP management platform based on the UNIX operating system.

The HP OpenView for Windows 7.0 developer's kit is \$2,500 and is available now. Version 7.1 of the developer's kit will be available in August at no additional cost to developers. The Application Builder, sold separately to developers, is \$1,000 and will be available in August.

The run-time license for HP OpenView for Windows 7.0 and 7.1 is \$595. Volume-purchase and original-equipment-manufacturer's discounts are available. Contact HP at 800/553-1305. ■



**By joining Interex, you'll profit from the skills and experience of talented HP-UX users. By joining now, you can take advantage of two of our strongest HP-UX support services: *hp-ux/usr* magazine and the *hp-ux/resource directory*!**

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### CSL/SITE

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usr1

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## SELECT SOFTWARE FORMAT FOR CSL TAPE: (CHECK ONE)

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